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TP 1624

Marine Casualty Investigations

Enquêtes sur les accidents maritimes

Investigation Report to the Minister pursuant to sections 542 or 545 of the Canada Shipping Act

Rapport d'investigation au Ministre conformément aux articles 542 ou 545 de la Loi sur la marine marchande du Canada

Canada

Ce rapport est aussi disponible en français.

REPORT OF INVESTIGATION INTO THE CIRCUMSTANCES ATTENDING THE COLLISION BETWEEN THE AMERICAN FISHING VESSEL "SUNMAR SEA" AND THE AMERICAN FISHING VESSEL "TRANSPAC" NEAR WORK ISLAND, PRINCESS ROYAL CHANNEL, B.C., RESULTING IN THE SINKING OF THE "TRANSPAC" AND THE LOSS OF ONE LIFE, NOVEMBER 22, 1986.

REPORT No. 478

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REPORT OF INVESTIGATION INTO THE CIRCUMSTANCES ATTENDING THE COLLISION BETWEEN THE AMERICAN FISHING VESSEL "SUNMAR SEA" AND THE AMERICAN FISHING VESSEL "TRANSPAC" NEAR WORK ISLAND, PRINCESS ROYAL CHANNEL, B.C., RESULTING IN THE SINKING OF THE "TRANSPAC" AND THE LOSS OF ONE LIFE, NOVEMBER 22, 1986.

Particulars of Vessels

Name	"TRANSPAC" ex "MOOSE"
Official Number	515174
Port of Registry	Seattle, Washington, USA
Flag	United States of America
Call Sign	WF 6796
Gross Tonnage	181
Net Tonnage	123
Length (Overall)	52.73 m (173 ft)
Length (Registered)	47.30 m (155.2 ft)
Breadth	11.61 m (38.1 ft)
Depth	3.81 m (12.5 ft)
Draught	3.35 m (11 ft) Fwd 4.26 m (14 ft) Aft
Type	Joint venture trawler ex offshore supply vessel
Built	1968 Burton Construction & Shipbuilding Corporation, Port Arthur, Texas
Re-built	1986 Foss Shipyard, Seattle, Washington
Propulsion	Twin Caterpillar Diesels, Model D399TA, 16 cylinder, each engine developing 1125 BHP driving twin 3 bladed, bronze propellers. Vessel fitted with two rudders.

Cargo	None
Crew	5
Classification	American Bureau of Shipping
Owners	Trans Pacific Seafoods, Seattle, Washington.

Navigating Equipment

Radar (2)	Raytheon, RAY6425/6 V-P Furuno, FR240
Radar Plotter	Raytheon, NWU51, Colour Video Plotter, interfaced with Raytheon Radar & Raytheon NRC 150 Radar adapter.
Echo Sounder (3)	(2) Simrad Skipper, CS 110's, Colour video sounders. (1) Raytheon, .720 flasher
Loran C (3)	(2) Raytheon, RAYNAV 750 MKII (1) Furuno, LC80
VHF Radiotelephone (2)	Raytheon, RAY 78, VHF/FM Gemtronics
SSB Radiotelephone (4)	Raytheon, RAY150, MT/HF SSB Harris Communications, 440 SSB Modar Triton TRT 1250
CB Radiotelephone	Cobra GT.21
Gyro Compass	Hokesyn, Model No.SIMRAD GC-101
Magnetic Compass	Ritchie , 19 cm (7.5")
Auto Pilot	Sperry 8-T, connected to magnetic compass.
Watch Alarm	Robertson WA 70

Life-saving Equipment

Liferafts (2)	Goodrich, 6 person, Inspected September 1986

	Switlik, 10 person, Inspected September 1986
Lifejackets (15)	
Immersion Suits (6)	
EPIRB (2)	ARC.Class 'A'

Certificates

Load Line Certificate	Issued at New York, USA, by ABS, January 3, 1985 and valid until May 3, 1987.
USCG Certificate of Documentation	Issued at Seattle, Washington, July 2, 1986. Documented for Fishery, Coastwise Registry.

Being documented as a Fishery Coastwise Vessel, the "TRANSPAC" was exempt from inspection by the US Coast Guard. However, the vessel is required to conform to USCG requirements regarding safety equipment.

The "TRANSPAC" was issued a US Coast Guard Certificate of Inspection, November 27, 1984, due to expire November 27, 1986, however, at the owner's request, the vessel's status as a certificated vessel was terminated November 14, 1986.

The "TRANSPAC" was surveyed for insurance purposes on September 17 and 18, 1986 at Seattle, Wash., both afloat and in dock, and was described as being well constructed, showed good maintenance, and was in satisfactory condition.

Description of Vessel

The "TRANSPAC" was a twin screw, former offshore drilling unit supply vessel converted for use as a joint venture trawler. She was of welded steel construction with a raked stem, transom stern and a V-shaped bottom. The vessel had a raised forecastle with her navigation bridge and accommodation located up forward and her engine-room aft of amidships. The vessel's underdeck spaces consisted mainly of fuel tanks, with a total capacity of 620,805 litres (164,000 US gallons), and ballast and fresh water tanks, with a total capacity of 151,416 litres (40,000 US gallons).

A joint venture trawler is a fishing vessel which, having made a catch of fish in her net, passes the net of fish to another vessel for hauling aboard and processing. Typical of such joint venture trawlers the "TRANSPAC" therefore had no need of, and did not have fish holds.

The bridge of the "TRANSPAC" was fitted with direct propulsion controls and she had an unmanned engine-room. Access to the engine-room was by way of a centreline service alleyway below the main deck from the forward house and a centreline alleyway below the main deck aft from the steering compartment. There were also port and starboard entrances from the main deck stack casings. Each of the four engine-room entrances were fitted with hinged steel watertight doors, secured by steel dogs.

The navigation bridge had open wings and the distance from bridge to bow was approximately 7 m (23 ft) and from bridge to stern, approximately 45 m (150 ft).

The navigating bridge console was essentially built around the steering position (see Figure 1) and the forward part was equipped with, amongst other instruments and controls, a steering wheel amidships, the auto pilot forward of the wheel and jog steering and engine controls to port of amidships. The magnetic compass was close to starboard of amidships and the master gyro compass on the port outboard side.

A continuation of the console to port of the steering position housed the two radar sets and colour plotter whilst a continuation to starboard housed the depth recorders. The chart table was located at the after starboard side of the wheel-house while the after port side contained hydraulic controls and a second jog steering position for use when trawling. A further set of engine controls and a third jog steering control were located on the starboard bridge wing.

Name	"SUNMAR SEA" ex "RODSAND" ex "HOMBORSUND-69"
Official Number	666754
Port of Registry	Seattle, Washington, USA
Flag	United States of America
Call Sign	WRC 9049
Gross Tonnage	495

Net Tonnage	353
Length (Overall)	57.9 m (190 ft)
Breadth	10.36 m (34 ft)
Depth	3.10 m (10.2 ft)
Draught	3.65 m (12.0 ft) Fwd 3.65 m (12.0 ft) Aft
Type	Refrigerated coaster (Documented as a fishing vessel)
Built	1956, A/B Asi-Verkin, Amel, Sweden
Re-built	1986, Marco, Seattle, Washington
Propulsion	MAK423, Machinenbau, 8 cyl. diesel, 680 BHP, Renjtes, single controllable pitch propeller
Bow thruster	Marco, Seattle, 300 HP
Cargo	829 tonnes (816 tons), solid block Surimi
Crew	7
Classification	Det Norske Veritas
Owners	Sunmar Shipping Inc., Seattle, Washington.

Navigating Equipment

Radar (2)	Raytheon, JRC Colour Radar #NCP3410 Raytheon 3400
Echo Sounder (2)	Simrad Skipper CS115, Colour Sounder Simrad Skipper 607, Recorder type
Loran C	Raytheon, RAYNAV 750 MK II

Satellite Navigator	Raytheon, RAYSAT 200
VHF Radiotelephone (2)	Raytheon, RAY88, VHF/FM Raytheon, RAY66
SSB Radiotelephone (2)	Raytheon, RAY1285 Hull, 922
2182 kHz Monitor	Simrad, RIV 105
Gyro Compass	Anschutz, Kiel DHI-46-26G-84
Magnetic Compass (2)	J.C.Krohn & Sons, Bergen, Sweden (in wheel-house) Unknown make (on flying bridge)
Auto Pilot	Robertson AP-6, Connected to gyro compass
Watch Alarm	One
Weather Facsimile	Simrad, TAIYOFAX, TF 733

Life-saving Equipment

Liferaft (1)	Switlik, 15 person, Inspected July 1, 1986
Lifejackets (9)	
Immersion Suits (9)	
Floater Work Vests (9)	
EPIRB	SAT Alert, ARC Class 'A'

Note:

The "SUNMAR SEA" was also fitted with two non-propelled, steel constructed lifeboats housed in luffing davits, but these were not required by regulation nor considered part of the vessels life-saving equipment.

Certificates

Load Line Certificate	Issued at Vancouver, B.C., by

	Det Norske Veritas, November 13, 1986, and valid until March 5, 1987.
USCG Certificate of Documentation	Issued at Seattle, Washington, July 1, 1986, (Documented for Fishery, Coastwise Registry)

Being documented as a Fishery, Coastwise Vessel, the "SUNMAR SEA" was exempt from inspection by the US Coast Guard. However, the vessel is required to conform to USCG requirements regarding safety equipment.

Description of Vessel

The "SUNMAR SEA" is a small, single screw shelter-deck reefer vessel. The crew accommodation, bridge and engine-room are located aft and there are two refrigerated cargo holds with 'tween-decks forward, serviced by two derricks at each hold.

The "SUNMAR SEA" is of welded steel construction and she has a bulbous bow and a bow thruster. There are two ballast tanks below the main deck, forward of the collision bulkhead. The No. 1 tank of 43,891 litres capacity (11,539 US gallons) extends into the bulbous bow and aft of it, the No.2 tank is of 21,539 litres capacity (5,690 US gallons).

The navigation bridge has open wings and the distance from bridge to bow is approximately 45 metres (150 feet) and from bridge to stern approximately 12 metres (40 feet).

The steering position is located in the centre of the compact wheel-house and forward of this position beside the midships window, are the jog steering, bow thruster, air whistle and searchlight controls. The searchlight directional handle is on the deckhead forward of the steering position and the two VHF radiotelephones are mounted on the deckhead close to port of the steering position.

Both radar sets are located on the port side of the wheel-house against the forward bulkhead, the closest one to amidships being the colour set. Mounted on the window ledge forward of this set, are a gyro repeater and rudder angle indicator. The second set is approximately one metre to port of the colour set and an observer would have his forward vision obstructed by the bulkhead and samson post from this vantage point.

The wheel-house is equipped with direct propulsion controls supported by an electric telegraph for emergency use and to

relay 'standby' and 'finished with engines'. The main engine and shaft are uni-directional and ahead and astern thrusts are obtained by blade pitch adjustments. The bridge controls, located to starboard of the midships window, give direct control over the speed of propeller rotation by means of a small wheel which is rotated to select the desired revolutions and an 'Eisenwerke Reintjes' telegraph, which is moved ahead or astern to select the amount of positive or negative pitch required on the propeller blades.

The vessel has a small chart room with a door at the after starboard corner of the wheel-house.

The "SUNMAR SEA" has a loaded service speed of 8.5 knots at 320 r.p.m. with the propeller at full pitch.

Note:

1. All times in this report are expressed in Pacific Standard Time (UTC minus 8 hours).

2. A glossary of terms and abbreviations can be found following the Findings of this report.

Background

While transitting the Princess Royal Channel on the evening of November 22, 1986, the American fishing vessels "TRANSPAC" and "SUNMAR SEA" were in collision south of Work Island in Butedale Passage, B.C.

The "TRANSPAC" was northbound to participate in joint venture fishing in the Bering Sea and the "SUNMAR SEA" was southbound with a cargo of refrigerated surimi for Bellingham, Washington.

The "TRANSPAC", with a crew of five on board, was holed in the engine-room, capsized and later sank. Four members of her crew were rescued but the chief engineer was missing and presumed drowned. His remains were later discovered in the wreck whilst operations to remove oil from the vessel were being conducted.

The "SUNMAR SEA" sustained some damage to her bulbous bow and after being released by RCC Victoria, continued on her voyage to Bellingham, Washington.

An environmental pollution problem existed in the area as a result of this casualty due to leakage of diesel oil from the sunken vessel until April 22/23, 1987 when all remaining diesel oil was pumped from the vessel.

Particulars of Deceased Person

Name	Tom M. Hite
Age	24
Address	Bellevue, Washington, USA
Position	Chief Engineer, "TRANSPAC"

Narrative

As there is some contradictory evidence regarding the circumstances surrounding the collision, the versions of both vessels are hereby described separately.

"TRANSPAC"

The American fishing vessel "TRANSPAC" departed from her berth at Trans Pacific Seafoods, Seattle, Washington, at 0100 November 21, 1986 with a crew of five on board including the master. Her destination was Ketchikan, Alaska, and from there she was to participate for the first time in joint venture fishing for pollack in the Bering Sea. The vessel sailed with 454,248 litres (120,000 US gallons) of diesel oil on board.

The "TRANSPAC" cleared the Hiram M Chittenden Locks in the Lake Washington Ship Canal at 0300 that same morning and entered Shilshole Bay, hence north through Puget Sound and Admiralty Inlet, towards the Strait of Georgia. The "TRANSPAC" participated in the Seattle Vessel Traffic Services (VTS) Reporting System whilst in American waters and as requested by Seattle VTS, she reported to Vancouver (VTS) at 1059 when passing Pedro Island, the first Canadian Calling-in-point (CIP) on the vessel's route.

The "TRANSPAC" continued her voyage north through the Strait of Georgia without incident and with the exception of some brief exchanges of information with Vancouver VTS during the course of the day, she did not participate in the Vancouver VTS reporting system. The last communication with VTS was a call at 1907 initiated by Vancouver VTS, to inquire as to her whereabouts; the "TRANSPAC" was in the vicinity of Hornby Island at this time.

No conventional watchkeeping system was kept on board the "TRANSPAC" and to allow the crew time to prepare the fishing gear, the master stood most of the bridge watches on the first day at sea, with the exception of a period between 1130 and 1600 when he rested; he remained on watch until

2400.

The "TRANSPAC" had an unmanned engine-room and carried only one engineer who worked mainly daytime hours unless otherwise required.

The vessel had an uneventful passage through the Strait of Georgia and Johnstone Strait and during the early hours of November 22, watches were divided amongst the crew. The master assumed conduct of the vessel again at 0800 and stood the daylight watches, allowing the crew to continue work on the fishing gear.

At about 1015, the "TRANSPAC" passed Cape Caution, leaving the Vancouver VTS zone limits and entered the Prince Rupert VTS zone. However, she did not participate in the reporting system.

At 1140, the "TRANSPAC" passed abeam of Cape Calvert and continued through the inner passages which is the route usually followed to avoid adverse weather conditions in Queen Charlotte Sound. The master remained on watch until clear of the narrow entrance to Tolmie Channel at 2030. A deck-hand arrived in the wheel-house at 2000 to relieve the watch, however, the master waited until the vessel was safely north-bound in Tolmie Channel before passing over the conduct of the vessel to him.

When the deck-hand assumed the bridge watch, the vessel was on magnetic compass automatic steering and proceeding in a northerly direction at her full service speed of approximately 10 knots through the water at 1020 r.p.m. on both engines. The colour radar and the interface plotter were turned on, and both VHF radiotelephones were on, one monitoring channel 16, and the other on an unbeknown channel.

The weather at the time was: moderate rain, visibility 2 to 3 miles, calm seas, and a light easterly breeze.

The master relayed his orders to the deck-hand and, after leaving instructions to call him at 2400, he proceeded to his quarters on the deck below for some rest.

As the vessel proceeded along Tolmie Channel and into Graham Reach, navigation was by radar distances off the land, and the colour radar set was being utilized on the 3 mile range. No positions were being plotted on the chart; the approximate track to be followed was marked by yellow felt tipped marker pen on each chart.

The "TRANSPAC" passed Sarah Head at 2130 and Heddington

Point at 2300. The wind was now reported to be from the south-west at 25 to 35 knots, necessitating leeway to be applied to maintain the desired course.

By 2200 that evening, all crew members of the "TRANSPAC", except the wheel-house watchkeeper, had retired to their quarters: each had his own cabin.

No traffic was encountered during the deck-hand's watch until about 2315 when the "TRANSPAC", proceeding through Butedale Passage on a course of approximately 283°T, and in an approximate position with the east end of Work Island bearing 032°T x 2.8 cables, picked up an echo on the outer limits of the radar PPI screen. The echo was reported as being 4° to port of the heading marker with the radar on the 3 mile range. Shortly afterwards, a vessel was sighted visually right ahead showing both green and red sidelights and two masthead lights in a vertical line.

Soon after detecting the target on radar, the deck-hand made a call on VHF, channel 16, reportedly requesting a port-to-port passing with the approaching vessel and, as there was no direct reply to the call, he made a course alteration of 5° to starboard. Although no radar plots were being performed on board the "TRANSPAC", it was deduced from radar observation, that the other vessel was approaching at a speed of between 10 and 12 knots from dead ahead, so a further alteration of 5° to starboard was made. The other vessel was later identified to be the American fishing vessel "SUNMAR SEA".

Additional small alterations of course were made to starboard until it was deemed unsafe for the "TRANSPAC" to navigate any closer to Work Island. With the other vessel inside the half mile range on radar and still reportedly dead ahead of the "TRANSPAC", the deck-hand realized a collision was imminent so he changed over to jog steering and turned the rudders hard-a-port, at the same time shouting for the master to come to the wheel-house.

The "TRANSPAC", still proceeding at full service speed, swung to port and as the bow of the other vessel cleared her forepart the helm was quickly turned to hard-a-starboard in an attempt to swing the stern clear. However, the stern of the "TRANSPAC" did not swing clear fast enough, and at 2330, November 22, 1986, the "SUNMAR SEA" struck the "TRANSPAC" on the starboard side in line with the engine-room stack casing, at an angle of impact of approximately 45°. The position of the collision was reported to be 53°10'36"N, 128°41'33"W, which is 1.1 cables south of Work Island light No.G5732(LL No.647).

The master, awakened by the deck-hand's shout and the noise of the impact, arrived in the wheel-house moments after the collision. He immediately assumed conduct of the vessel and noted that the "SUNMAR SEA" was hard up against his starboard side. He found his vessel still on jog steering on a heading of approximately west-north-west and reportedly close to the western tip of Work Island. He cannot recall the helm and engine settings at this time.

"SUNMAR SEA"

The American fishing vessel "SUNMAR SEA" departed from her home port of Seattle, Washington, October 23, 1986 and arrived in Dutch Harbour, Alaska, November 1. She discharged her general cargo and sailed again November 3, arriving off Sand Point, Alaska, November 5 where she loaded 829 tonnes (816 tons) of frozen 'surimi' trans-shipped from the Korean factory processing ship "TSUDO MARU". 'Surimi' is a minced fish paste, usually made from pollack.

On completion of loading, the "SUNMAR SEA" departed Sand Point at 1520, November 16 with a crew of seven on board including the master; her destination was Bellingham, Washington.

The "SUNMAR SEA" had an uneventful passage during the first part of the voyage and she arrived off Forester Island at 1551, November 21, at which time she reported to Prince Rupert VTS, obtaining permission to transit the Prince Rupert VTS zone. The vessel then continued through Dixon Entrance and across the Hecate Strait, passing abeam of White Rocks at 1030, November 22, and entered the Principe Channel.

The navigating officers of the "SUNMAR SEA" stood a conventional 4 on, 8 off, watchkeeping system. The second officer stood the 0000-0400 watch, the master the 0400-0800 and the chief officer, the 0800-1200 watch; however, due to storm warnings in the area and the fact that the vessel was in confined waters, watches were doubled on the afternoon of November 22.

The "SUNMAR SEA" passed through Otter Channel at 1730 and at 2000, she passed abeam of Blackfly Point at the north end of Gil Island, at which time the chief officer relieved the master, and assumed conduct of the vessel. Also, at 2000, the chief engineer assumed the engine-room watch. The second officer who had stood the 1600-2000 watch along with the master, had a short break and returned to the wheel-house to assist on the chief officer's watch. The master remained in the wheel-house until approximately 2100 and having relayed his night orders, he retired to his quarters on the deck

below for some rest.

At 2000 the vessel was on gyro compass automatic steering and proceeding with the engine turning 1020 r.p.m., giving a speed of approximately 7.7 knots over the ground in the prevailing weather and tidal conditions. Both radar sets were in operation and both VHF radiotelephones were on: one monitoring channel 16 and the other on channel 11, the appropriate assigned frequency for communicating with Prince Rupert VTS.

As the vessel proceeded through McKay Reach and entered Fraser Reach, the chief officer was in charge of the navigation whilst the second officer kept a look-out and attended to VHF radiotelephone communication. Navigation was by radar and in some areas, positions were plotted on the chart, whilst in others, courses were maintained by monitoring preset bearings and distances off the land.

At 2200, the "SUNMAR SEA" was in a position with Kingcome Point abeam bearing 243°T, distance 0.5 miles. This position together with an ETA for Griffin Point was reported to Prince Rupert VTS. VTS notified the "SUNMAR SEA" that they would meet the northbound ferry "MALASPINA" while en route to Griffin Point. The weather being experienced at this time was: near gale force south-south-easterly winds, fair visibility in rain, and a rough chop on the water.

About 2300, the second engineer, who was off watch, entered the wheel-house as an observer; he remained at the starboard side window so as not to interfere with the navigation of the vessel.

As the "SUNMAR SEA" approached Butedale Passage on a course of 135°T & G, an echo appeared on the PPI screen to port of the heading marker, at approximately 3 miles distance, later identified to be the "TRANSPAC". Shortly after detecting the echo on radar, the "SUNMAR SEA" was in a position with the north-westerly tip of Work Island, bearing 103°T, distance 5.9 cables, at which time the "TRANSPAC" was sighted visually approximately 2 points on the port bow, at a distance of 2.5 miles; she was displaying open masthead lights and a green sidelight.

The "SUNMAR SEA" altered course to 145°T & G when abeam of the north-westerly tip of Work Island which lined her heading marker on the point of land to the north-east of Butedale and kept her to the starboard side of the channel. At this time, it was noticed that the masthead lights of the "TRANSPAC" had closed somewhat, indicating that she may have altered course to starboard.

Although no radar plots were performed on board the "SUNMAR SEA", it was deduced from radar observation that the "TRANSPAC" was keeping to mid-channel and was apparently bound for Fraser Reach.

At 2325, the bridge officers on the "SUNMAR SEA" heard a call on the VHF radiotelephone and although the message was not entirely straightforward and its source was unidentified, it was understood to be a request for the vessel in Fraser Reach to agree to a port to port passing. The "SUNMAR SEA" identified herself on VHF radiotelephone channel 11, and, believing the call to have come from the "MALASPINA", agreed to a port to port passing.

In the meantime, the officer of the watch on board the "MALASPINA", which was approaching Griffin Point some 10 miles away, heard his vessel being called and answered on VHF channel 11. The navigation officer on board the "SUNMAR SEA" answered the VHF in order to allow the second officer to maintain a proper look-out from his vantage point beside the coloured radar set. The "SUNMAR SEA" agreed to a port to port passing with the "MALASPINA", but received no reply.

The "MALASPINA" made a further attempt to communicate with the "SUNMAR SEA" to inform her that the "MALASPINA" was not the vessel in Butedale Passage, however, interference on the VHF prevented this call from being heard by the "SUNMAR SEA".

During the time these radio communications were taking place, it was observed that the "TRANSPAC" had altered course further to starboard and was displaying both her red and green sidelights and her masthead lights were in a vertical line.

The navigation officer on the "SUNMAR SEA", having received no reply to his last transmission, suspected that he was not in fact about to pass the "MALASPINA" but another unidentified vessel; however, he was not unduly concerned since both vessels were in a passing situation with no apparent problems.

With the "SUNMAR SEA" approaching her alteration point to continue through Butedale Passage, the navigation officer moved quickly from the radiotelephone and glanced at the port side radar for the distance to the beach ahead of him. Nearing his CPA of 3 cables, he made his way to the midship window to make certain that the "TRANSPAC" was continuing her starboard turn. It was then that he observed the "TRANSPAC" had made a severe turn to port and was attempting to cut across the bows of the "SUNMAR SEA"; the vessels were between

3.5 and 4 cables apart at this time. The navigation officer immediately began flashing his searchlight at the "TRANSPAC" to warn her of the dangerous situation and switched the "SUNMAR SEA" over to the hand steering mode; being close to both the jog steering control and to the steering wheel he was now personally in a position to use whatever steering mode the situation warranted.

When the "TRANSPAC" still continued her swing to port, the navigation officer of the "SUNMAR SEA", with the vessel still on her course and with the helm amidships, moved the propeller pitch selector handle to zero pitch (stop) then to 'full astern'. This action, however, was too late and 30 to 45 seconds later, with about two-thirds of the way off the vessel, the bow of the "SUNMAR SEA" struck the starboard side of the "TRANSPAC" at an angle of impact of approximately 90°, becoming embedded in the vessel in the vicinity of her engine-room. The engines of the "TRANSPAC" continued full ahead after the collision, pivoting both vessels around to starboard.

The time of the collision was 2330, November 22, 1986, and the position was 53°10'06"N, 128°41'26"W.

The weather was reported to be as follows:

Wind	SSE 25-30 knots
Visibility	3 miles in rain squalls
Sea	Windchop (sheltered waters)
Sea Temperature	7.7°C

Awakened by the collision, the master of the "SUNMAR SEA" arrived in the wheel-house moments later and observed that his vessel was hard up against the starboard side of the "TRANSPAC" and on assuming the conduct of the vessel, he noted that the rudder was amidships and the engine going 'full astern'. He ordered that the bow thruster be turned on and made available immediately and that a damage assessment be carried out without delay. A cursory inspection revealed that the vessel appeared to be damaged only in her No.1 tank, forward of the collision bulkhead.

Events Following the Collision

Following the collision, both vessels manoeuvred clear of one another and communicated on VHF channel 16, switching to channel 6 to converse.

The "TRANSPAC", once clear of the "SUNMAR SEA", reportedly moved away from Work Island and headed towards mid-

channel. The chief engineer arrived in the wheel-house just behind the master and was ordered to the engine-room to report the extent of the damage. He made his way aft via the service alleyway followed closely by the first mate who stopped momentarily to silence the engine-room bilge-alarm siren located near the engine-room entrance. Moments later, the chief engineer emerged from the lower engine-room to report that the vessel was badly holed and that he had started both bilge pumps, but there was no hope of them coping with the rate of flooding. The watertight door to the engine-room was securely dogged. The master ordered all crew members to don their immersion suits and to prepare the liferafts.

At 2332.5, the master of the "TRANSPAC" broadcast on VHF channel 16 that his vessel was taking water in the engine-room and had lost auxiliary power; he then switched to channel 6 and communicated with the "SUNMAR SEA". During the ensuing conversation, it was agreed that the "SUNMAR SEA" would stand-by to assist as necessary. The "TRANSPAC" also indicated her intention to proceed towards the beach on Princess Royal Island, and that her crew, equipped with immersion suits, would be abandoning ship in the liferafts.

At 2334.5, the "SUNMAR SEA" reported the collision to Prince Rupert VTS on VHF channel 11, and advised them she would render any necessary assistance. Prince Rupert VTS requested that they be kept updated on the situation.

At 2336.5, Prince Rupert VTS reported the collision to Rescue Co-ordination Centre (RCC), Victoria.

On board the "TRANSPAC", the liferaft tie-downs were released in readiness for launching and at the chief engineer's request, crew members assisted him to lower the port liferaft from its stowed position on the bridge deck to the port side aft on the forecastle deck. The crew members then continued forward to clear away the anchors.

The master of the "TRANSPAC", being unfamiliar with the area in the vicinity of the collision, proceeded towards the steep-to shoreline with its high cliffs, in the hope of finding a suitable shallow spot to beach the vessel. As she made her approach to the shore, all propulsion power was lost and the vessel struck the rocky shoreline and came to a complete stop. At this time the "TRANSPAC" was visibly sinking deeper aft but was not listed. The order was given to launch the liferafts overboard.

The "MALASPINA", located in the vicinity of Griffin Point when the collision occurred, monitored VHF trans-

missions on channels 16, 11 and 6, and communicated with the "SUNMAR SEA".

At 2337, the "MALASPINA" informed Prince Rupert VTS that she was proceeding at 16.5 knots to the scene of the collision and would assist as necessary. She also informed Prince Rupert VTS that the "TRANSPAC" now had her bow against the beach and that her crew was preparing to abandon ship. The "MALASPINA" agreed to liaise with Prince Rupert VTS as neither VTS nor the Prince Rupert Coast Guard Radio Station (CGRS) had VHF channel 6 capabilities in the collision area.

Shortly after coming to a stop alongside the beach, the "TRANSPAC" began listing quickly to starboard. Crew members ceased clearing away the anchors and quickly made their way along the port side to assist the chief engineer, Mr. Hite, heave the liferaft overboard. However, as the list had increased to about 45° and the bow was rising, the attempt was abandoned and the decision was made to jump overboard. The cook/deck-hand was the first to make his way over the bulwark and into the water followed closely by the mate/deck-hand who had to slide down the hull as the list increased. Mr. Hite, the chief engineer, was last seen at the top of the bulwark behind the first mate with his immersion suit zipped up only as far as his waist and his arms still outside the suit.

The "TRANSPAC", sinking quickly by the stern, listed rapidly to starboard and with a spiral motion, assumed a vertical position with only the bow and part of the wheel-house above water. The vessel continued turning in a clock-wise direction, scraping against the rock-faced shoreline. As crew members frantically attempted to move clear of the "TRANSPAC", the tremendous suction and turbulence drew them under water with the vessel, making escape extremely difficult. Three crew members eventually climbed on to a rocky ledge whilst another swam clear to seaward. The master, who barely escaped through the wheel-house door with a deck-hand, had his partially secured immersion suit sucked from his body. The "TRANSPAC" capsized in approximate position 53°10'06"N, 128°42'06"W.

The "SUNMAR SEA", which by this time had look-outs stationed around the vessel, forward searchlights and halogen lights turned on, and a jacob's ladder rigged over the starboard side in readiness for survivors to board from their liferafts, now radioed the "MALASPINA" for assistance as she did not have a suitable rescue boat for the change in circumstances. At this time, those on the "SUNMAR SEA" could see the survivors on the beach and a foredeck look-out could hear a survivor in the water.

The "MALASPINA" arrived on scene at 0002, November 23 and her crew lowered the ship's motorized lifeboat. The "SUNMAR SEA" moved astern to allow the "MALASPINA" manoeuvring space and with the aid of the searchlights on the "MALASPINA", the lifeboat crew rescued the four survivors.

The lifeboat was used to search for Mr. Hite and at 0031 the "MALASPINA" requested assistance from the Canadian Coast Guard to search for the missing seaman.

The survivors were taken to the "MALASPINA" where they were treated for hypothermia while the lifeboat continued the search for the chief engineer.

Prince Rupert VTS informed RCC Victoria of the request for assistance and at 0038 RCC issued a 'MAYDAY' relay broadcast via Prince Rupert CGRS and VTS, on VHF channels 16 and 11. Several vessels responded to the broadcast including the B.C. ferry "QUEEN OF THE NORTH", the cargo vessel "HAIDA BRAVE" and the fishing vessel "HUNGRY ONE". The "MALASPINA", acting as on scene commander (OSC), led the "SUNMAR SEA" and the aforementioned vessels in a search for the missing seaman: RCC Victoria directed the operation and provided search data.

At 0105 RCC tasked the Canadian Coast Guard cutter (CCGC) "POINT HENRY" and at 0127, the CCGC "DARBY", both stationed at Prince Rupert.

At 0230 the "MALASPINA" was ordered by RCC to proceed to Prince Rupert with the survivors and the "QUEEN OF THE NORTH" assumed the duties of OSC until relieved by the "POINT HENRY" which arrived on scene at 0615.

At 0835, November 23, the "MALASPINA" landed the survivors at Prince Rupert: none required hospitalization.

The "SUNMAR SEA" was stood down at 0750 November 23 and was advised by VTS to give them hourly position reports. The vessel was later diverted to Port McNeil on November 24 to assist the Royal Canadian Mounted Police (RCMP) in their investigation into the collision and she subsequently arrived at Bellingham, Washington, on the evening of November 26.

The "TRANSPAC" was last seen afloat at 0350, November 23 and was later reported as having sunk in position 53°10'45"N, 128°43'03"W., in 60 m (200 ft) of water. She was later declared a total loss.

An area between Asher Point in Graham Reach and Kingcome Point at the north entrance to Fraser Reach and the beaches

in the vicinity of the collision were searched by shore parties for the missing chief engineer but without success. At 1625, November 23, all search units were stood down and the incident was turned over to the RCMP as a missing person.

This casualty presented an environmental pollution problem in the area since diesel oil was escaping from the submerged vessel.

Mr. Hite's remains were recovered April 22/23, 1987 during operations to remove oil from the sunken vessel.

Analysis

"TRANSPAC"

1. Construction and History of Vessel

The "TRANSPAC" was built at Port Arthur, Texas in 1968 as an offshore oil-rig supply vessel and in 1979 she was converted at Mobile, Alabama, into a containerized freighter. During her conversion, the "TRANSPAC" had a 1.82 m (6 ft) extension added to her stern and her bulwarks were raised to 1.98 metres (6.5 ft) in height. The "TRANSPAC" underwent a second conversion in 1986 at Seattle, Washington where she was converted for use as a 'joint venture' trawler. Changes to the vessel included a 3.35 m (11 ft) extension of the forecastle deck aft of the house, giving a sheltered work area at the forepart of the main deck. Two trawl winches were fitted on the main deck forward and a mid-water net reel amidships. A gantry with two net reels, a wire winch, and a trawl ramp, were fitted aft and hydraulic gates were installed in the bulwarks aft. Three ballast tanks were converted for use as fuel tanks.

Also during her refit in 1986, the vessel was drydocked in September and her hull, rudders and propellers were inspected and repaired as necessary.

The "TRANSPAC" underwent sea trials before setting out on her first trip north as a joint venture trawler.

Stability tests were carried out on the "TRANSPAC" on May 5, 1979 and a supplemental stability report was made in 1986 for her new operating conditions.

2. Fuel Tanks

The "TRANSPAC" departed from Seattle, Washington, two days prior to the collision, with 454,248 litres (120,000 US gallons) of diesel oil on board. The diesel oil was carried in No.4 and No.5 port and starboard tanks immediately forward of the engine-room and in the port and starboard engine-room day tanks. The vessel had a daily fuel consumption of approximately 5,678 litres (1,500 US gallons) when steaming. The "TRANSPAC" also carried about 3,028 litres (800 US gallons) of hydraulic oil and 2,271 litres (600 US gallons) of lubricating oil in tanks located in the lower port side of the engine-room.

Diesel oil continued to leak slowly from the "TRANSPAC" and a salvage team, contracted by the Canadian Coast Guard, commenced operations on the sunken vessel April 16, 1987. Pumping of the remaining oil commenced April 22 and was successfully completed April 23, 1987.

Some 59,098 litres of diesel oil were recovered from the sunken vessel and it is therefore estimated that 384,386 litres of diesel oil grade No.2 were lost. No attempt was made to pump out the lubricating oil from the vessel as the operation would require the divers to enter the engine-room which was considered to be extremely hazardous.

3. Navigation Appliances

The navigation appliances and steering gear on the "TRANSPAC" were in good working order during the vessel's passage from Seattle and there was no reported malfunction of the vessel's machinery.

4. Radar

The "TRANSPAC" was being navigated by the colour radar set in a relative motion, unstabilized, head-up presentation. The set was not connected to the gyro compass.

The coloured plotter, which was interfaced with the colour radar, was also in operation as a second radar and could be used in the stabilized or unstabilized mode. However, the deck-hand in charge of the watch was not thoroughly familiar with its operation and chose to use the colour radar.

The radar was being used to help determine if the "SUNMAR SEA" was on a collision course although no

actual plotting was being performed. The deck-hand on watch was not trained in radar plotting nor was he required to be, as a deck-hand.

5. **Magnetic Compass**

The magnetic steering compass was assumed to have no deviation error.

The "TRANSPAC" had no provisions for taking visual bearings.

6. **Publications**

Charts and publications on board the "TRANSPAC" were reportedly current editions and kept in good order.

Charts for the vessel's intended route were laid out in consecutive order and the times of passing prominent points were noted on the chart and in the bridge log book. The bridge log book was salvaged at the time of abandoning the vessel.

There were neither written standing orders nor written night orders on board the "TRANSPAC". Any instructions to the person in charge of the bridge watch were conveyed verbally by the master.

"SUNMAR SEA"

7. **Construction and History of Vessel**

The "SUNMAR SEA" was built at Amel, Sweden in 1956 as a general cargo vessel and in 1986 she was converted into a refrigerated vessel at Seattle, Washington.

During her conversion, the "SUNMAR SEA" was completely rebuilt forward of the superstructure, with two refrigerated cargo holds, giving a total of four refrigerated compartments each capable of a temperature range of +12°C to -35°C. The vessel had a bulbous bow and a bow thruster fitted and her engines were rebuilt.

The vessel has a cargo-carrying capacity of 1,000 short tons and is capable of carrying 12 containers on deck.

Stability tests were carried out on the "SUNMAR SEA" at Seattle, July 1, 1986 at the request of the vessel's insurance company and the US Coast Guard, who were in attendance, later approved the stability booklet October 10, 1986.

8. **Navigation Appliances**

The navigation appliances and steering gear on the "SUNMAR SEA" were in good working order during the vessel's passage from Alaska and there was no reported malfunction of the vessel's machinery.

9. **Radar**

The "SUNMAR SEA" was being navigated by radar; both sets were on a relative motion, unstabilized, head-up presentation as the sets were not connected to the gyro compass.

Radar was being used to determine if the "TRANSPAC" was on a collision course although no actual plotting was being performed in the confined waters, with both vessels in sight of one another.

10. **Gyro Compass**

The gyro compass reportedly had no error.

No visual bearings were being taken prior to the collision.

11. **Publications**

Charts, Tide tables, List of Lights and other nautical publications on board the "SUNMAR SEA" were kept updated and in good order. Charts for the vessel's intended route were laid out in consecutive order and the times of passing prominent points were noted in the bridge log book along with the bearing and distance from the point.

There were neither written standing orders nor written night orders on board the "SUNMAR SEA". Any instructions to the person in charge of the bridge watch were conveyed verbally by the master.

12. **Weather**

The marine forecast for Dixon Entrance and Hecate Strait, issued by Environment Canada at 1045, November 22, 1986 and valid until 1100 November 23, was as follows:

HECATE STRAIT, DIXON ENTRANCE

Storm Warning Continued.

> Southeasterly winds 20 to 30 knots increasing to gales 35 to 45 early in the afternoon and to storm force 50 to 70 knots by the end of the afternoon. Winds becoming south to southwest gales 45 to storm force 55 this evening. Rain, at times heavy, beginning this afternoon, lowering visibility to one mile. Rain changing to showers this evening.

The weather reported by local lightstations was as follows:

Boat Bluff — Wind southeasterly 35 knots and gusting. Sea moderate 3 feet
Overcast, moderate rain
Visibility 5 miles

McInnes Is. — Wind southeasterly 56 knots gusting to 74 knots
Sea rough 16 feet, heavy swell
Overcast, moderate rain,
Visibility 6 miles
Barometer 989.1 mb and falling
Sea water temperature 9.8°C

The on-scene weather as reported by search vessels in the sheltered Princess Royal Channel was as follows:

> Wind southeasterly 25-35 knots, Moderate/ heavy rain squalls, Visibility 1 to 4 miles, Light chop on water, sea water temperature approximately 7.7°C.

13. Tides

Tidal streams in Princess Royal Channel flow from north and south and meet in Graham Reach in the vicinity of Aaltanhash Inlet. In Graham Reach, between the north end of Sarah Island and Aaltanhash Inlet, the flood sets north and the ebb south. In Butedale Passage and Fraser Reach, the flood sets towards the south-east and the ebb north-west.

Low water at Butedale was predicted to be at 2308, November 22, 1986, 22 minutes before the time of the collision, with a height above chart datum of 1.5 metres.

The strongest currents in the area of Princess Royal Channel are experienced at Hiekish Narrows. On November

22, the maximum ebb current at Hiekish Narrows was predicted to be at 1945 with a rate of 2.2 knots and slack water was predicted to be at 2345.

In view of the above predictions, the tidal current in the vicinity of Butedale Passage and approaches about the time of the collision, would be almost negligible and the SSE'ly wind would be the more dominant factor.

According to tidal predictions, after rounding Kingcome Point at 2200, the "SUNMAR SEA" would have experienced a current of approximately 0.4 knots in a north-westerly direction.

The "TRANSPAC" would have experienced an ebb tide flowing south until passing Heddington Point after which, the ebb tide would flow to the north, however, the rate would be negligible.

Aids to navigation in the area were verified by Coast Guard subsequent to the casualty and it was determined that they were operational. There had been no complaints from either vessel in this respect. Butedale Passage, some 3 miles in length and averaging 6.5 cables in width, is described in the Sailing Directions as being 'the passage most frequently used; it is deep and clear of dangers.' Since 1975, no other collisions have been reported to Transport Canada as having occurred within the geographical limits of Butedale Passage.

14. Average Speeds

The average speed of the "SUNMAR SEA" made good over the ground from Kingcome Point to her reported collision position was 7.5 knots.

The average speed of the "TRANSPAC" made good over the ground between Sarah Head and Heddington Point was 9.83 knots; from Heddington Point to her reported collision position was 9.9 knots and to the collision position as reported by the "SUNMAR SEA", it was 10.4 knots.

15. Vessel Traffic Services

In order to promote safety of navigation, the protection of the environment and the safe and efficient movement of marine traffic, Vessel Traffic Services (VTS) zones have been established throughout Canadian waters under the legislative authority of the Canada Shipping Act, Part XX 730(1).

The Canadian Coast Guard has established Vessel Traffic Services for waters east of Vancouver Island, defined as the Vancouver Traffic Services Zone; for waters west of Vancouver Island, defined as the Tofino Traffic Services Zone, and for waters off the northern coast of British Columbia, defined as Prince Rupert Traffic Services Zone. All are voluntary services and mariners wishing to participate can find information on VTS coverage, procedures and information systems, in the current Annual Edition of Notices to Mariners published by the Aids and Waterways branch of the Canadian Coast Guard; in 1986, the information was contained in Notice No.25. Mariners are cautioned however, that all vessels within the geographical area covered by the services may not be participating in the service or may not be fitted with the required radio equipment.

The VTS centres attempt to enhance the safe and efficient movement of marine traffic by encouraging the monitoring of a common VHF frequency by all participating vessels within the waters in question. The centres are equipped with VHF transmission and receiving facilities both locally and from remote sites. All participating vessels should voluntarily report their name and estimated time of arrival at the next calling-in-point to the VTS centre at each designated calling-in-point listed and in turn, will receive all reported information of a similar nature on vessels underway in this area.

The current edition of the Canadian Coast Guard publication 'Radio Aids to Marine Navigation' (Pacific) lists the Pacific Coast VTS stations and peripheral sites along with their transmitting and receiving frequencies.

There is no intention on the part of the Canadian Coast Guard to attempt to navigate or manoeuvre ships from a shore station, and nothing in the aforementioned Notice overrides the authority of the master or his responsibilities for the safe navigation of his ship in accordance with the Collision Regulations.

The provision of Notice No.25 applied to both the "TRANSPAC" and the "SUNMAR SEA" since they are both over 20 metres in length.

There is a joint Canada/United States agreement for a co-operative Vessel Traffic Service for the Juan de Fuca Region in the areas containing the Canada/United States boundaries, administered by the United States Coast Guard Vessel Traffic Center at Seattle, and in Canada by

the Vancouver and Tofino Vessel Traffic Services.

The United States Vessel Traffic Service is mandatory for vessels in the Strait of Juan de Fuca, east of Port Angeles and in the waters of Rosario Strait, Admiralty Inlet and Puget Sound.

Whilst transitting the Vancouver Vessel Traffic Services zone, the "TRANSPAC" communicated with Vancouver VTS approximately five times, whereas there are some seventeen calling-in-points on her route. The "TRANSPAC" did not report to Prince Rupert VTS whilst in the Prince Rupert VTS zone: there were seven calling-in-points to the collision position.

On the other hand the "SUNMAR SEA" participated fully in the system reporting in at all five CIP's along with two unscheduled calls to update her movements.

16. VHF Radiotelephone Regulations

Section 8 of the VHF Radiotelephone Practices and Procedures Regulations, made pursuant to the Canada Shipping Act, requires every ship transitting a VTS zone to maintain a continuous listening watch on the VHF frequency appropriate to that zone or part thereof. This applies to every vessel whether it elects to participate or not.

If a vessel is only fitted with one VHF radio, the local Coast Guard Vessel Traffic Service Centre or the Coast Guard Radio Station will maintain a listening watch on channel 16 VHF on behalf of that vessel as required.

Section 9 of the same regulations requires that a navigation safety call be given on the frequency on which a ship is maintaining a watch when risk of collision with another ship is deemed to exist, when doubt exists as to the actions or intentions of another ship, or before the ship commences a manoeuvre that will impede the safe navigation of other ships. The navigation call shall indicate the ship's identity, location and intended course of action.

The "TRANSPAC" was not guarding channel 11, the appropriate assigned VTS frequency, but channel 16, and her navigation safety call did not include her identity, location or frequency, nor was the context of the message clear and concise. The content of the message was recorded by Prince Rupert VTS and Prince Rupert CGRS at 2325, November 22.

17. VTS Participation

The "TRANSPAC" was not participating in the Prince Rupert VTS system, nor was she required by regulation to do so.

The "SUNMAR SEA" was participating fully in the Prince Rupert VTS system and while passing Kingcome Point at 2200, the vessel was advised by VTS that she would meet the northbound ferry "MALASPINA" before the next calling-in-point at Griffin Point.

A VHF transmission at 2325 by an unidentified vessel was heard by the "SUNMAR SEA" and since the "SUNMAR SEA" was monitoring channels 11 and 16 as required by regulation, and since she was expecting to pass the "MALASPINA", the only other reported vessel in the area, it was at first assumed that the unidentified vessel was the "MALASPINA" calling on channel 11 as required.

This would appear to be a logical assumption on the part of the "SUNMAR SEA" as the communication consisted of passing arrangements, and information of this type is normally conducted on VTS frequencies and not on channel 16, the calling and distress frequency.

The VHF transmission, later identified as being on channel 16, at 2325, was transcribed from tapes at VTS Prince Rupert and read as follows:

> The vessel in Fraser Reach there I'll take you on my starboard side here on my port side your starboard.

The transmitting vessel did not identify herself but it was later determined to have been the "TRANSPAC". The message itself shows confusion in the mind of the R/T operator.

For approximately one minute after the broadcast from the "TRANSPAC", the "SUNMAR SEA" and the "MALASPINA" called one another but, due to their simultaneous and overlapping transmissions, the vessels did not succeed in communicating with each other.

Prince Rupert VTS centre recorded conversations on VHF channels 11 and 16 before and after the collision and an audio transcript was made later. Since the Prince Rupert VTS remote sites have three operating frequencies and all are recorded on a single audio channel which cannot differentiate between frequencies, the CGRS audio tapes

of channel 16 were used to identify transmissions on that channel and the VTS operator identified the transmission on channel 11. Prior to the above-mentioned transmission at 2325, there were no other taped transmissions that may have indicated that the "TRANSPAC" was in the area. In view of the single channel VTS recording of three different frequencies, some difficulty was encountered during the investigation, in identifying the respective transmissions and in isolating a transmission on one frequency from a stronger transmission on another.

After the collision, the vessels involved mutually agreed to use VHF channel 6 for their communications. Channel 6 is a designated intership frequency only and thus the frequency is not normally monitored by Coastal or VTS radio stations. Consequently neither Prince Rupert VTS nor the CGRS had channel 6 capabilities in the collision area and were forced to request other vessels to relay information until all communications were moved to channel 16.

18. General Information

(a) Testimony on behalf of the "TRANSPAC" on events prior to the collision was given by the deck-hand who was the sole person on watch. The deck-hand had very little sea-going experience, was uncertificated, and exhibited a lack of proficiency in his knowledge of navigation.

The deck-hand became concerned at the apparent closeness of the "TRANSPAC" to Work Island as the two vessels closed each other. This could be accounted for by the conditions of weather and darkness, other bridge duties and lack of experience in operating and adjusting the radar controls for such situations.

(b) It is impossible to reconstruct the exact track of the "TRANSPAC" prior to the collision, as no positions, courses, or times were recorded and there is conflicting testimony between the two vessels as to the position of the collision.

While the "SUNMAR SEA" did not record times of positions, she did however, reportedly, plot enough positions to retrace her track prior to the collision.

(c) The testimony regarding the "SUNMAR SEA" being 4° on the port bow of the "TRANSPAC" when first detected, is contradicted if estimated positions for both vessels for this same time are marked on the chart, and indicate the

"SUNMAR SEA" to have been 11° on the starboard bow of the "TRANSPAC". This agrees closely with the position where the "SUNMAR SEA" was reported to have been at this time. A position of 4° on the port bow of the "TRANSPAC" at 3 miles distance, as evidenced, would plot on the land.

(d) The testimony regarding the "SUNMAR SEA" being constantly dead ahead of the "TRANSPAC" and showing both sidelights and masthead lights in a vertical line after several alterations of course to starboard by the "TRANSPAC", is not considered possible.

(e) The position of the collision as testified by the "TRANSPAC" is considered to be in conflict with the fact that it was indicated that the vessel was closer to the west bank of the channel than to Work Island when it was decided to beach the vessel. Additionally, in view of the several manoeuvres involved in inspecting the vessel, moving clear of the "SUNMAR SEA" and other necessary decisions following the collision, only seven minutes elapsed until the "TRANSPAC" touched the west bank, a distance of 6.5 cables from the initial collision position as estimated by the master of the "TRANSPAC".

(f) Under normal circumstances, a northbound vessel traversing Butedale Passage would, when in the vicinity of Butedale, have a course alteration of about 35° to starboard to line up with Fraser Reach. Similarly, a southbound vessel would have an alteration of about 35° to port coming from Fraser Reach to line up with Butedale Passage.

Vessels approaching each other in this area would normally pass port to port, each having due regard to the other's position relative to mid-channel. Northbound vessels, when in the vicinity of Butedale, must take into consideration that the southbound vessel will eventually have to alter course to port and must therefore, be prepared to keep to starboard of mid-channel at all times.

(g) At the time of the first radiotelephone broadcast at 2325 the vessels, with a combined rate of approach of approximately 17.5 knots, would have been about 1.46 miles apart.

When the "TRANSPAC" deemed it necessary to alter course to port, the vessels were estimated to be 3.5 to 4 cables apart which would have taken 1.2 to 1.4 minutes

at the above rate of approach, not allowing for the full astern action of the "SUNMAR SEA".

19. Ship's Deck Watch Regulations

The "TRANSPAC", being a vessel in excess of 100 tons, was required to comply with the Ship's Deck Watch Regulations made pursuant to the Canada Shipping Act (See Annex No. 1). Whilst in Canadian waters the vessel was required to have at least two deck watches, each consisting of a properly certificated person and an additional person. The "TRANSPAC" did not comply with the requirements of these regulations.

20. Collision Regulations

(a) The International Regulations for Preventing Collisions at Sea, 1972, (Collision Regulations) Part "A", General Rule 1, states in part, under the heading 'Application':

> (a) These Rules shall apply to all vessels upon the high seas and in all waters connected therewith navigable by seagoing vessels.

Rule 2, of the Collision Regulations also states, under the heading of 'Responsibility':

> (a) Nothing in these Rules shall exonerate any vessel, or the owner, master or crew thereof, from the consequences of any neglect to comply with these Rules or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.

The above Rules indicate that the Collision Regulations apply equally to the "TRANSPAC" and the "SUNMAR SEA".

The International Regulations for Preventing Collisions at Sea, 1972, Part B, Section 1, Rule 5, under the heading 'Look-out' states:

> Every vessel shall at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of

collision.

The Canadian Coast Guard publication TP1018, 'Recommended Code of Nautical Procedures and Practices, 1985, 3rd Edition, containing IMO Regulations and Resolutions states in part:

4. Watch arrangements

(a) The composition of the watch shall at all times be adequate and appropriate to the prevailing circumstances and conditions and shall take into account the need for maintaining a proper look-out.

(b) When deciding the composition of the watch on the bridge which may include appropriate deck ratings, the following factors, inter alia, shall be taken into account:

(ii) weather conditions, visibility and whether there is daylight or darkness;

(iii) proximity of navigational hazards which may make it necessary for the officer in charge of the watch to carry out additional navigational duties;

(v) whether the ship is fitted with automatic steering

9. Look-out

In addition to maintaining a proper look-out for the purpose of fully appraising the situation and the risk of collision ... in maintaining a look-out the following shall be observed:

(a) the look-out must be able to give full attention to the keeping of a proper look-out and no other duties shall be undertaken or assigned which could interfere with that task;

(b) the duties of the look-out and helmsman are separate .... The officer in charge of the watch may be the sole look-out in daylight provided ....;

The "TRANSPAC" was being navigated by only one man who

had to guard the steering, navigate the vessel and keep a look-out.

(B) Rule 7 of the Collision Regulations 'Risk of Collision' states in part that "proper use shall be made of radar equipment.." but cautions that "assumptions shall not be made on the basis of scanty information, especially scanty radar information" and that "risk of collision... shall be deemed to exist if the compass bearing of an approaching vessel does not appreciably change."

Due to the nature of the waters being traversed, long range radar detection was not possible, nor was it possible for the vessels to sight each other visually at a much greater distance than 2.5 miles regardless of the weather, due to Work Island being situated between the vessels. Assumptions on behalf of the "TRANSPAC" were apparently made on the basis of scanty information and inexperience when the "SUNMAR SEA" was estimated to be steaming at 10 to 12 knots and some doubt exists as to the approximate bearings of the "SUNMAR SEA" from the "TRANSPAC" throughout the incident.

Neither vessel was taking visual bearings; the "TRANSPAC" was not equipped to do so.

(C) Rule 14 of the Collision Regulations, 'Head-on Situation', states:

> (a) When two power-driven vessels are meeting on reciprocal or nearly reciprocal courses so as to involve risk of collision, each shall alter her course to starboard so that each shall pass on the port side of the other.
>
> (b) Such a situation shall be deemed to exist when a vessel sees the other ahead or nearly ahead and by night she could see the masthead lights of the other in a line or nearly in a line and/or both sidelights and by day she observes the corresponding aspect of the other vessel.
>
> (c) When a vessel is in any doubt as to whether such a situation exists she shall assume that it does exist and act accordingly.

Rule 15 of the Collision Regulations, 'Crossing Situation', states:

(a) When two power-driven vessels are crossing so as to involve risk of collision, the vessel which has the other on her own starboard side shall keep out of the way and shall, if the circumstances of the case admit, avoid crossing ahead of the other vessel.

Under these regulations, whether the vessels were in a head-on situation or a crossing situation, the "TRANSPAC" was the give-way vessel and initially she did alter course to starboard. In the case of a head-on situation, the "SUNMAR SEA" was required to alter course to starboard; she reportedly did alter 10° to keep to the starboard side of the channel.

Rule 9 of the Collision Regulations requires vessels in narrow channels to keep to the outer limit of the channel which lies on her starboard side. The narrowest part of Butedale Passage is about 6 cables and has deep water in close to the shoreline.

D) Rule 8 of the Collision Regulations, 'Actions to Avoid Collision', states in part:

(a) Any action taken to avoid collision shall, if the circumstances of the case admit, be positive, made in ample time and with due regard to the observance of good seamanship.

(e) If necessary to avoid collision or allow more time to assess the situation, a vessel shall slacken her speed or take all way off by stopping or reversing her means of propulsion.

Rule 16 of the Collision Regulations,'Action by Give-way Vessel', states:

Every vessel which is directed to keep out of the way of another vessel shall, so far as possible, take early and substantial action to keep well clear.

Rule 17 of the Collision Regulations, 'Action by Stand-on Vessel', states in part:

(a) (i) Where one of two vessels is to keep out of the way, the other shall keep her course and speed.

(ii) The latter vessel may however take action to avoid collision by her manoeuvre alone, as soon as it becomes apparent to her that the vessel required to keep out of the way is not taking appropriate action in compliance with these Rules.

(b) When, from any cause, the vessel required to keep her course and speed finds herself so close that collision cannot be avoided by the action of the give-way vessel alone, she shall take such action as will best aid to avoid collision.

The vessels first sighted each other at approximately 2.5 miles distance and at a combined rate of approach of 17.5 knots this would have been 8.6 minutes before the collision. At this time, according to testimony, each vessel altered course to starboard, each keeping to starboard of mid-channel.

At 2325 when the "TRANSPAC" was in doubt as to the actions of the "SUNMAR SEA", she did not slacken speed, stop, or reverse in order to avoid collision or to gain time to assess the situation.

The "TRANSPAC" swung hard-a-port across the bows of the "SUNMAR SEA" without due regard for the observance of good seamanship.

As the vessels were nearing an area where each would normally alter course to follow their respective routes, the "SUNMAR SEA" was not unduly concerned until the "TRANSPAC" swung hard-a-port. At this time the vessels were estimated to be 3.5 to 4 cables apart, 1.4 minutes approximately. The "SUNMAR SEA" then left her 'full astern' movement too late to avert a collision.

(E) Manoeuvring and Warning Signals to be used between vessels are specified in Rule 34 which states that when a vessel "...is in doubt whether sufficient action is being taken by the other to avoid collision, the vessel in doubt shall immediately indicate such doubt by giving at least five short and rapid blasts on the whistle".

Signals to Attract Attention are described in Rule 36 which states that "if necessary to attract the attention of another vessel any vessel may make light or sound signals that cannot be mistaken for any signal author-

ized elsewhere in these Rules..".

Neither vessel sounded any manoeuvring or warning signals; the "SUNMAR SEA" used her searchlight as a danger signal after the "TRANSPAC" altered hard-a-port.

21. **Angle of Impact**

Conflicting testimony exists between the "SUNMAR SEA" and the "TRANSPAC" regarding the angle of impact. The "SUNMAR SEA" reported that the angle of impact was approximately 90°, while the "TRANSPAC" reported the angle to be approximately 45°.

Crew members on both vessels reported that moments after the collision, the vessels were observed to be at an angle of approximately 90° to each other with the "SUNMAR SEA" still lodged in the side of the "TRANSPAC".

The nature of the damage to both vessels would tend to indicate the actual angle of impact to have been closer to 90°.

Danton's 'Theory and Practice of Seamanship' advises that if a vessel strikes another head-on, she should stay embedded in the gash but that this is only advisable in smooth sea conditions; rough seas could increase the damage.

22. **Pilotage**

The Pilotage Act, section 14(1) (a & b) gives the Pacific Pilotage Authority the right to establish compulsory pilotage areas and to prescribe the ships or classes of ships that are subject to compulsory pilotage.

The Pacific Pilotage Regulations, section 9, indicates that every ship that is over 350 gross tons is subject to compulsory pilotage, except in special circumstances where a waiver applies. Section 3 of the Regulations indicates the areas where compulsory pilotage exists.

The "SUNMAR SEA" was in Area 3 of the compulsory pilotage areas, did not have a pilot on board and had not applied for a waiver.

The "TRANSPAC", being under 350 gross tons, was exempt from carrying a pilot.

23. Life-saving Appliances

(a) The two lifeboats on board remained from the vessel's previous employment but were not required by regulation for her current employment. They had not been inspected by the USCG nor were they considered by those on the vessel, as being part of the established life-saving equipment aboard.

(b) Although fitted with life-saving appliances as required by regulation, the "SUNMAR SEA" found herself in a position where she was not equipped to effect a speedy rescue of survivors from the water and the beach as neither of her boats were motorized nor were they approved by the US Coast Guard as lifeboats; consequently the launching arrangements had not been checked or tested. Additionally, with a total complement of seven persons, it would have been difficult and time-consuming to lower and man a boat in darkness, in the prevailing weather conditions.

It was proposed to launch the vessel's liferaft had the "MALASPINA" not been close to the area.

(c) The "TRANSPAC" was fitted with launching ramps beside each liferaft for speedy launching. It is not known why the chief engineer had the port liferaft lowered to the forecastle deck. The master was not aware of the chief engineer's actions.

Both liferafts were serviced in September 1986. One liferaft was recovered by a search vessel in the area where the "TRANSPAC" sank and the other is assumed to have still been secure in its cradle and sank with the vessel.

The "TRANSPAC" carried two EPIRB's, one of which was stowed inside the inflatable liferaft and which was subsequently recovered. The other, which was not the free-floating type, was held in a bracket on the port bridge wing and presumably was lost with the vessel.

24. Cold Water Survival

Scientific studies of body cooling rates on average men and women holding still in ocean water of 10°C and wearing a standard lifejacket and light clothing, show a predicted survival time of 2.5 to 3 hours; extra body fat can increase this time.

In this case, the water in the area was reported to be

approximately 7.7°C, which would have reduced the above mentioned survival time.

It was reported that when last seen, the chief engineer had his immersion suit on to waist level only. On recovery of his remains from the wreck it would appear that the immersion suit had been properly and totally fastened.

25. Damage

Collision damage to the "TRANSPAC" was video-taped using a remote diving device and although the exact frames could not be identified, the nature of the damage is consistent with evidence as presented by crew members and from damage sustained by the bulbous bow of the "SUNMAR SEA".

The damage to the "TRANSPAC" consisted of a hole in her bottom entering into the engine-room where the flat bottom rises towards the transom stern. The hole is approximately 1.5 m (5 ft) in length by 1.1 m (3.5 ft) in height, corresponding to the damage to the bulbous bow of the "SUNMAR SEA" and consistent in positioning with the corresponding draughts of both vessels at the time of the collision.

The damage to the "SUNMAR SEA" below the waterline amounted to about the top 1.1 m (3.5 ft) of her bulbous bow which was set back for approximately 1.2 m (4 ft) in length. The vessel also had a 0.6 m (2 ft) vertical gash between 3 m (10 ft) and 3.7 m (12 ft) above the water-line corresponding to the height of the raised bulwarks of the "TRANSPAC".

The nature of the damage to the bulbous bow of the "SUNMAR SEA" tends to indicate that the top half of the bulb struck the bottom of the "TRANSPAC" and the bottom half cleared the underside of the vessel. The "SUNMAR SEA" presumably came to a stop when her bow came into contact with the bulwarks of the "TRANSPAC" vertically above the extremity of the damage to the bulb.

26. Location of Body

Human remains, discovered on April 21 and April 22, were recovered on April 23 at 1400 and flown to Prince Rupert. They were later identified to be the remains of Tom Hite. An immersion suit, reportedly found fully zipped up and in good condition, and which contained the majority of the remains, had been located on the main

deck forward, to port of the trawl winches and beneath the forecastle deck extension.

27. **Engine-room Pumps**

The "TRANSPAC" was equipped with two electric motor driven, manual start, centrifugal pumps, both with 12.7 cm (5 in) suctions and 7.6 cm (3 in) discharges.

Both pumps were started following the collision.

Bilge alarms were installed in the engine-room, steering room and forward service alleyway.

28. **US Inspection Requirements**

Under Title 46 of the US Code of Federal Regulations-Shipping, Public Law 98-89-August 26, 1983, chapter 33, both the "TRANSPAC" and "SUNMAR SEA" were exempt from inspection by the US Coast Guard.

Being an uninspected fishing vessel under 200 gross tons, the "TRANSPAC", under US controlling statute, did not require a set manning scale, nor was she required to carry certificated officers under the requirement of Title 46, sub-chapter P, 'Manning of Vessels', part 157, section CFR 157.30-10, 'Officers for Uninspected Vessels', however, the master and the chief engineer were certificated.

The "SUNMAR SEA" being over 200 gross tons, was required to carry certificated officers under section CFR 157.18-1, of the above mentioned regulations and she did carry the requisite number.

29. **Search Vessels**

The following vessels assisted in the search for the chief engineer of the "TRANSPAC" on the evening of November 22 and on November 23:

(a) The "SUNMAR SEA" remained in the area after the collision until she was stood down at 0750 November 23.

(b) The "MALASPINA" arrived on scene at 0002 and was released by RCC Victoria at 0750.

(c) The B.C. ferry "QUEEN OF THE NORTH" was tasked at 0040 and arrived on scene at 0215.

(d) The cargo vessel "HAIDA BRAVE" was tasked at 0041 and arrived on scene at 0139.

(e) The fishing vessel "HUNGRY ONE" was tasked at 0047 and arrived on scene at approximately 0430.

(f) The CCGC "POINT HENRY" was tasked at 0106 and arrived on scene at 0615.

(g) The CCGC "DARBY" was tasked at 0127 and arrived on scene at 1123.

All search vessels were stood down at 1625, November 23 and further searches were conducted by the RCMP on November 24.

30. **Experience and Qualifications of Personnel**

"SUNMAR SEA"

The master of the "SUNMAR SEA" holds a Master Foreign-going Certificate of Competency issued at Boston, Mass., November 23, 1981. He had 14 years seagoing experience of which 5 years were as master. He had served as Master on the "SUNMAR SEA" for 4 months.

The chief officer of the "SUNMAR SEA" holds a Master of Freight and Towing Vessels of not more than 1,000 gross tons upon oceans, Certificate of Competency, issued at Puget Sound, Washington, March 7, 1985, and Radar Observer (unlimited). He had 17 years seagoing experience of which 9 years were as master. He had served on the "SUNMAR SEA" for approximately 3 months.

The second officer of the "SUNMAR SEA" holds a Mate, Freight and Towing Vessels of not more than 500 gross tons, Certificate of Competency, with endorsements, issued September 27, 1984 in New Orleans, and also qualified as a Radar Observer (unlimited). He had been at sea since 1981 and was on his first trip on board the "SUNMAR SEA".

"TRANSPAC"

The master of the "TRANSPAC" holds a Master, Freight and Towing Vessels of not more than 500 gross tons, upon coastal waters, Certificate of Competency, issued at Seattle, Washington, January 1985. He had sailed on fishing vessels for 11 years, approximately 2 years of which, were as master. He sailed with Trans Pacific

Seafoods during 1984 and 1985 and rejoined the company in August 1986 to take command of the "TRANSPAC".

The deck-hand on watch on the "TRANSPAC" at the time of the collision did not hold a certificate of competency nor was he required to by regulation, as a deck-hand. His seagoing experience commenced on fishing vessels in 1983 and he has since served 3 months as skipper of another vessel. He joined the "TRANSPAC" as a substitute crew member for the journey north just before she sailed from Seattle.

Findings

The American fishing vessel "SUNMAR SEA" collided with the American fishing vessel "TRANSPAC" in the sheltered waters of Butedale Passage, B.C., in darkness, during rain squalls and near gale force winds but otherwise fair visibility. The bow of the "SUNMAR SEA" struck the after starboard side of the "TRANSPAC", damaging the vessel, and causing her to capsize and sink. One crew member from the "TRANSPAC" lost his life.

It would appear that the following factors contributed to the casualty:

"TRANSPAC"

- as the give way vessel, did not give way and did not avoid crossing ahead of the other vessel, as required by Rule 15(a) of the Collision Regulations;

- as the give way vessel, did not take early and substantial action to keep well clear, within the confines of the channel, as required by Rule 16;

- did not take action as necessary to avoid collision, as required by Rule 8;

- did not maintain a proper look-out so as to make a full appraisal of the situation and risk of collision, within the meaning and the requirement of Rule 5;

- the deck-hand was unable to maintain a proper look-out in view of the fact that he was alone on watch and also had to guard the steering and navigate the vessel;

- the deck-hand in charge of the watch was not

certificated, nor was he proficient in the art of navigation, the use of the radar or conversant with the Collision Regulations;

- did not participate in the voluntary VTS system in the area;

- did not effectively guard VHF channel 11 as required by the VHF Radiotelephone Practices and Procedures Regulations;

- did not make full and proper use of the VHF radiotelephone in an attempt to contact the other vessel when it was believed that the "TRANSPAC" was being forced too close to Work Island;

- did not make appropriate sound or light signals to attract attention in an emergency situation, as required by Rules 34 and 36 of the Collision Regulations; and

- failed to positively identify the extent of damage sustained by the vessel before manoeuvring away from the "SUNMAR SEA", as required by the practice of good seamanship.

"SUNMAR SEA"

- initially, based on VTS information, assumed that the approaching vessel was a regularly scheduled ferry and which would be familiar with the area and adhere to a port-to-port passing;

- was not able to ascertain whether the approaching vessel was the ferry due to local topography and overriding VHF transmissions from other stations;

- did not use channel 16 as an alternative channel to channel 11;

- was unable to prevent the collision despite taking avoiding action; and

- disengaged her bulbous bow from the "TRANSPAC" before that vessel had assessed the damage, as required by the practice of good seamanship.

Other Findings

The general area of Butedale Passage is restricted,

requiring a major course alteration to transit the passage in the area where the collision occurred.

The "SUNMAR SEA" did not have a pilot on board as required by the Pacific Pilotage Regulations nor did she apply for a waiver to release her of such obligation in a compulsory pilotage area.

The "TRANSPAC" did not have the properly certificated persons on board nor did she maintain the required watchkeeping system whilst navigating in Canadian waters, as required by the Ship's Deck Watch Regulations.

The position of the collision, as estimated by those on the "TRANSPAC", appears to have been plotted incorrectly, too close to Work Island.

The "SUNMAR SEA" was unable to offer immediate rescue of the survivors in the water as she was not equipped with a suitable craft.

The actions of the "MALASPINA" were in accordance with good seamanship.

Rescue communications were conducted on VHF channel 6 by mutual agreement between the "TRANSPAC" and the "SUNMAR SEA" rather than on the distress frequency of channel 16 as designated.

Relevant communications on VHF channels other than 11 and 16 could not be monitored by VTS Prince Rupert and Prince Rupert Coast Guard radio stations. Those transmissions that were recorded, were often unreadable due to static and other interference and relevant conversations were sometimes overriden by other VHF traffic.

The chief engineer of the "TRANSPAC" had apparently decided to lower the port liferaft from its launching ramp to the forecastle deck and was performing other duties which may have contributed to his becoming trapped as the vessel sank.

OTTAWA, ONTARIO
JULY 1987.

Glossary

BHP	Brake Horsepower
CB	Citizens Band (Radio)
CIP	Calling-in-point
CPA	Closest point of approach
EPIRB	Emergency Position Indicating Radio Beacon
Full Away	Full ahead sea speed
Jog Steering	A jog steering control is a spring-loaded lever which needs only be pushed to left or right to obtain port or starboard wheel respectively
kHz	Kilohertz
Knot	One nautical mile per hour
Nautical Mile	1.151 statute miles (1.852 km)
OSC	On scene Commander
Point (on the bow)	An angle of 11¼°
PPI Screen	Plan Position Indicator
RCC	Rescue Co-ordination Centre
RPM (r.p.m.)	Revolutions per minute
Samson post	A strong pillar passing between decks
SSB	Single side band (radio)
USCG	United States Coast Guard
UTC	Co-ordinated Universal Time
VHF	Very High Frequency (radio)

Ships' Deck Watch Regulations

REGULATIONS RESPECTING THE ESTABLISHMENT OF DECK WATCHES AND THE NUMBER AND QUALIFICATIONS OF NAVIGATIONAL PERSONNEL ON SHIPS

Short Title

1. These Regulations may be cited as the *Ships' Deck Watch Regulations*.

Application

3. (1) Subject to subsection (2), these Regulations apply to all self-propelled ships of more than 5 tons in

(*a*) Canadian waters

Deck Watches

4. (1) Subject to subsections (2) and (3), there shall be established for every ship at least two deck watches and in each deck watch the persons required by subsection 7(1) shall be different from such persons in the other deck watches.

Navigation Personnel

6. A deck watch that complies with section 7 shall be on duty on board every ship.

7. (1) Subject to subsection (2), each deck watch on a ship shall consist of at least the following persons:

(*a*) a person in charge of the deck watch;

(*b*) an additional person, except on

(i) a ship engaged in log sorting or yarding operations carried out without the use of lines or chains at a booming ground,

(ii) a ship of 100 tons or less carrying 12 passengers or less that is making a voyage of 5 nautical miles or less in good visibility between sunrise and sunset in any one day within the limits of a harbour, if there is an unobstructed all round view at the steering position, or

(iii) a ship of 1,000 tons or less that is securely moored or anchored;

Qualifications of Navigational Personnel

8. (1) Subject to subsections (3), (4) and (5), no person shall act or be permitted to act as master or person in charge of the deck watch on a ship of more than 100 tons, unless he is

(*a*) the holder of a valid certificate or licence that is

(i) accepted by the Minister, and

(ii) appropriate for the duties to be performed, the class of the ship and the area in which the ship operates; and

(*b*) capable of properly operating the navigational equipment with which the ship is fitted.

(2) Where in his opinion there is reasonable ground for doubt as to the ability of a master or person in charge of a deck watch to operate properly the navigational equipment with which the ship is fitted, an inspector may require the person concerned to demonstrate his practical ability to operate such equipment.

Règlement sur les quarts à la passerelle des navires

RÈGLEMENT CONCERNANT L'ÉTABLISSEMENT DES QUARTS À LA PASSERELLE AINSI QUE LE NOMBRE ET LES TITRES ET QUALITÉS DES MEMBRES DU PERSONNEL NAVIGUANT À BORD DES NAVIRES

Titre abrégé

1. Le présent règlement peut être cité sous le titre: *Règlement sur les quarts à la passerelle des navires*.

Application

3. (1) Sous réserve du paragraphe (2), le présent règlement s'applique à tous les navires autopropulsés jaugeant plus de 5 tonneaux, qui se trouvent dans

a) les eaux canadiennes

Quart à la passerelle

4. (1) Sous réserve des paragraphes (2) et (3), au moins deux quarts à la passerelle doivent être établis pour chaque navire et les membres d'équipage tenus, aux termes du paragraphe 7(1), de les assurer ne peuvent faire partie des deux.

Personnel de navigation

6. Un quart à la passerelle conforme aux dispositions de l'article 7 doit être de service à bord de tout navire.

7. (1) Sous réserve du paragraphe (2), chaque quart à la passerelle doit comprendre au moins les personnes suivantes:

a) une personne responsable du quart à la passerelle;

b) une autre personne, sauf dans le cas

(i) d'un navire affecté au triage ou au rassemblement des billes dans une aire de flottage sans l'aide de câbles ni de chaînes,

(ii) d'un navire de 100 tonneaux au plus qui transporte au plus 12 passagers sur un voyage de 5 milles marins au plus qu'il fait par bonne visibilité, entre le lever et le coucher du soleil, dans les limites d'un port, la vue étant optimale dans toutes les directions au poste de gouverne, ou

(iii) d'un navire de 1,000 tonneaux au plus qui est solidement amarré ou ancré;

Qualités des membres du personnel de navigation

8. (1) Sous réserve des paragraphes (3), (4) et (5), nul ne doit remplir ou être autorisé à remplir les fonctions de capitaine ou de personne responsable du quart à la passerelle d'un navire jaugeant plus de 100 tonneaux, à moins d'être:

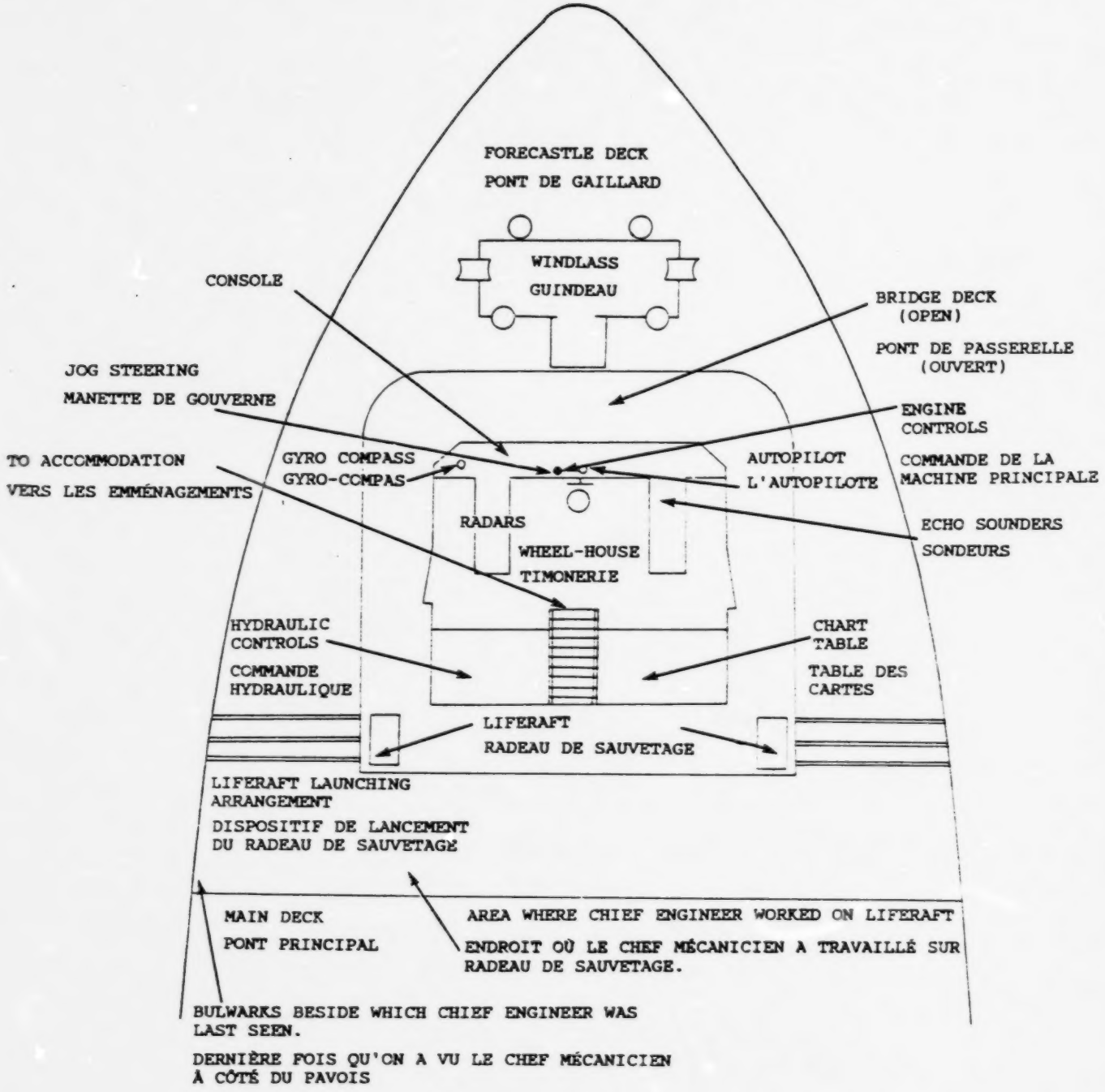
a) titulaire d'un certificat ou d'une licence valable

(i) acceptés par le Ministre, et

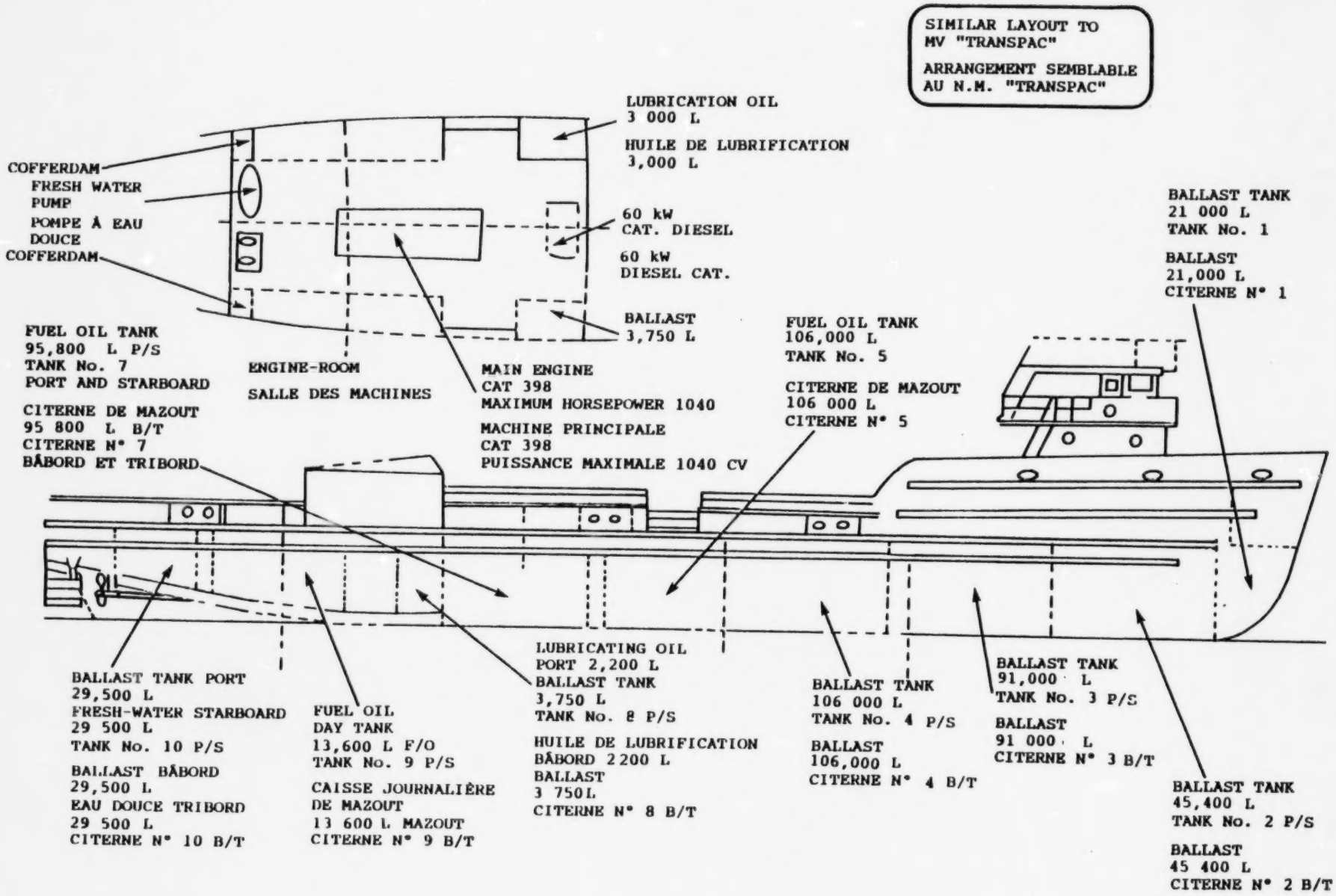
(ii) correspondant aux fonctions à remplir, à la classe du navire ainsi qu'à la zone d'exploitation du navire; et

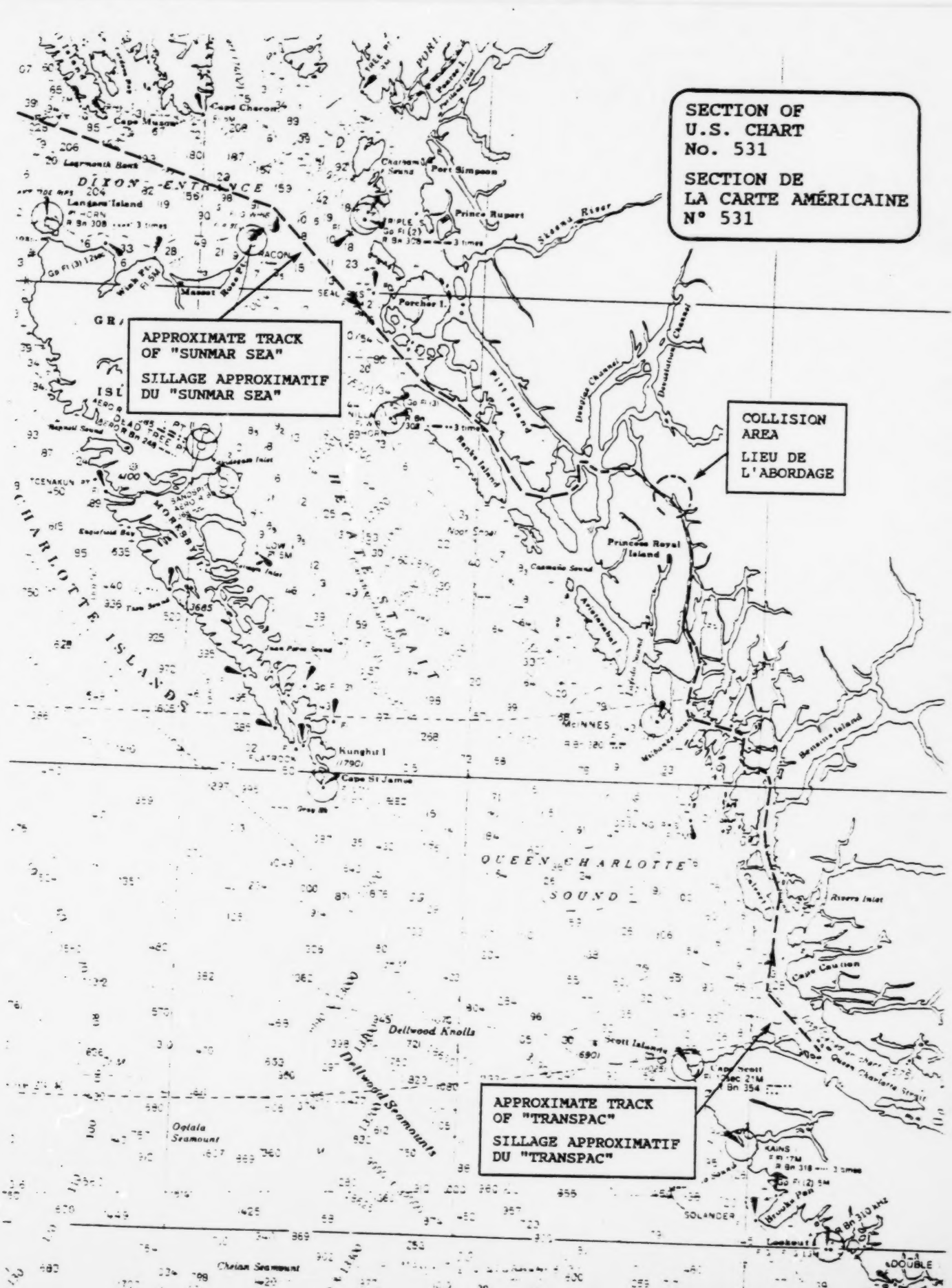
b) capable de faire fonctionner correctement les instruments de navigation dont le navire est muni.

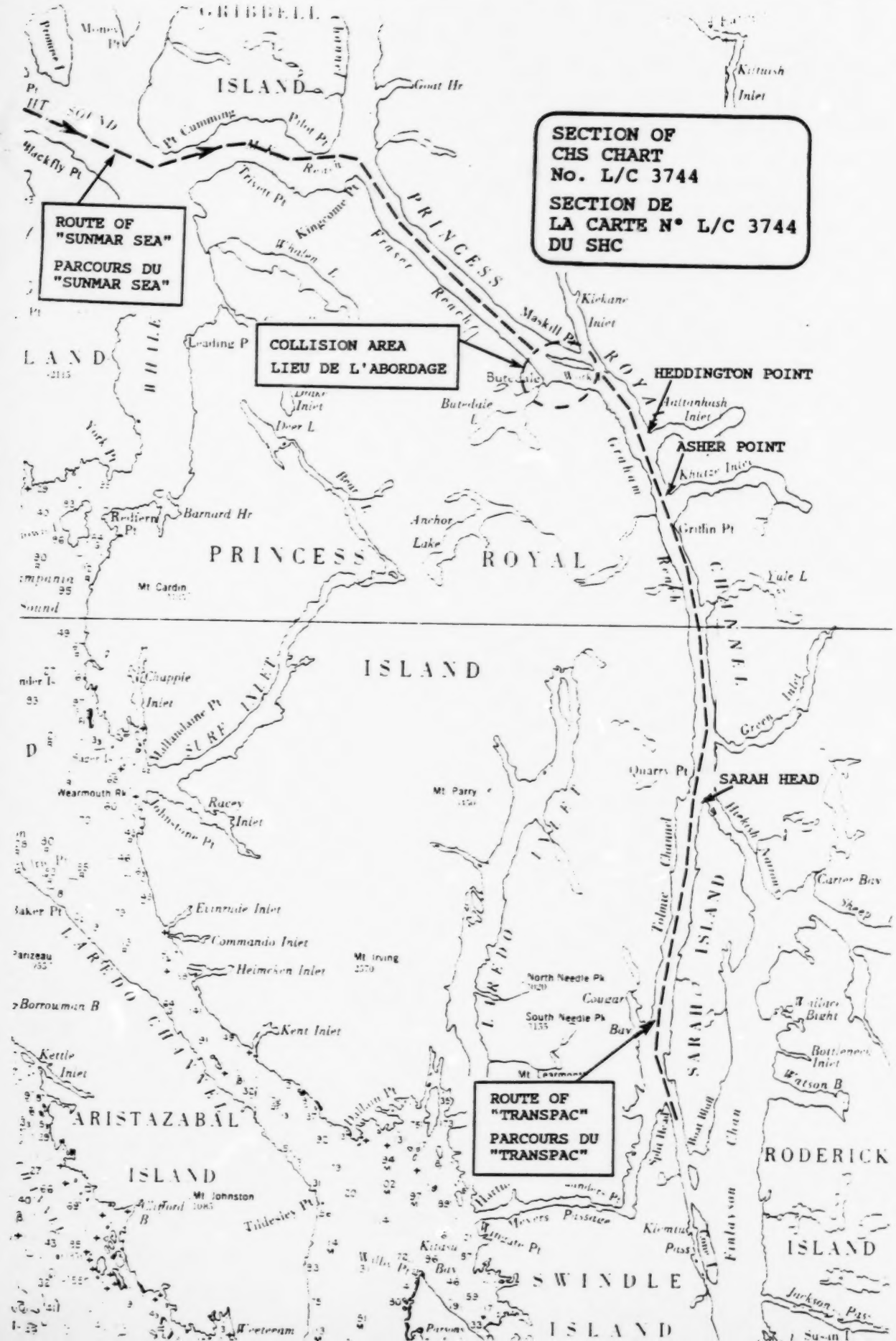
(2) Lorsqu'un inspecteur estime qu'il y a des motifs raisonnables pour mettre en doute l'aptitude d'un capitaine ou d'une personne responsable du quart à la passerelle à faire fonctionner correctement les instruments de navigation dont le navire est muni, il peut exiger de la personne en cause de démontrer son aptitude à faire fonctionner ces instruments.

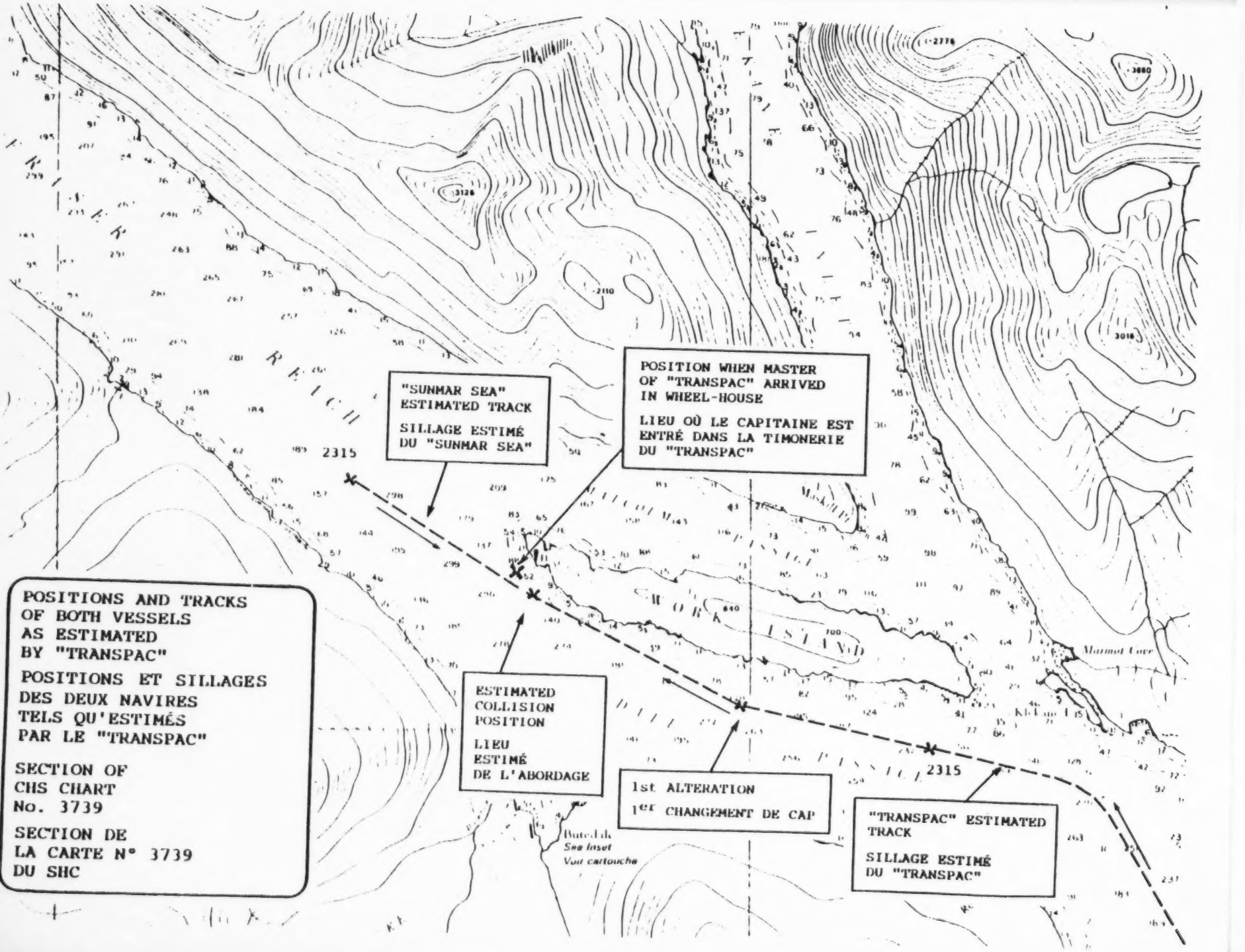


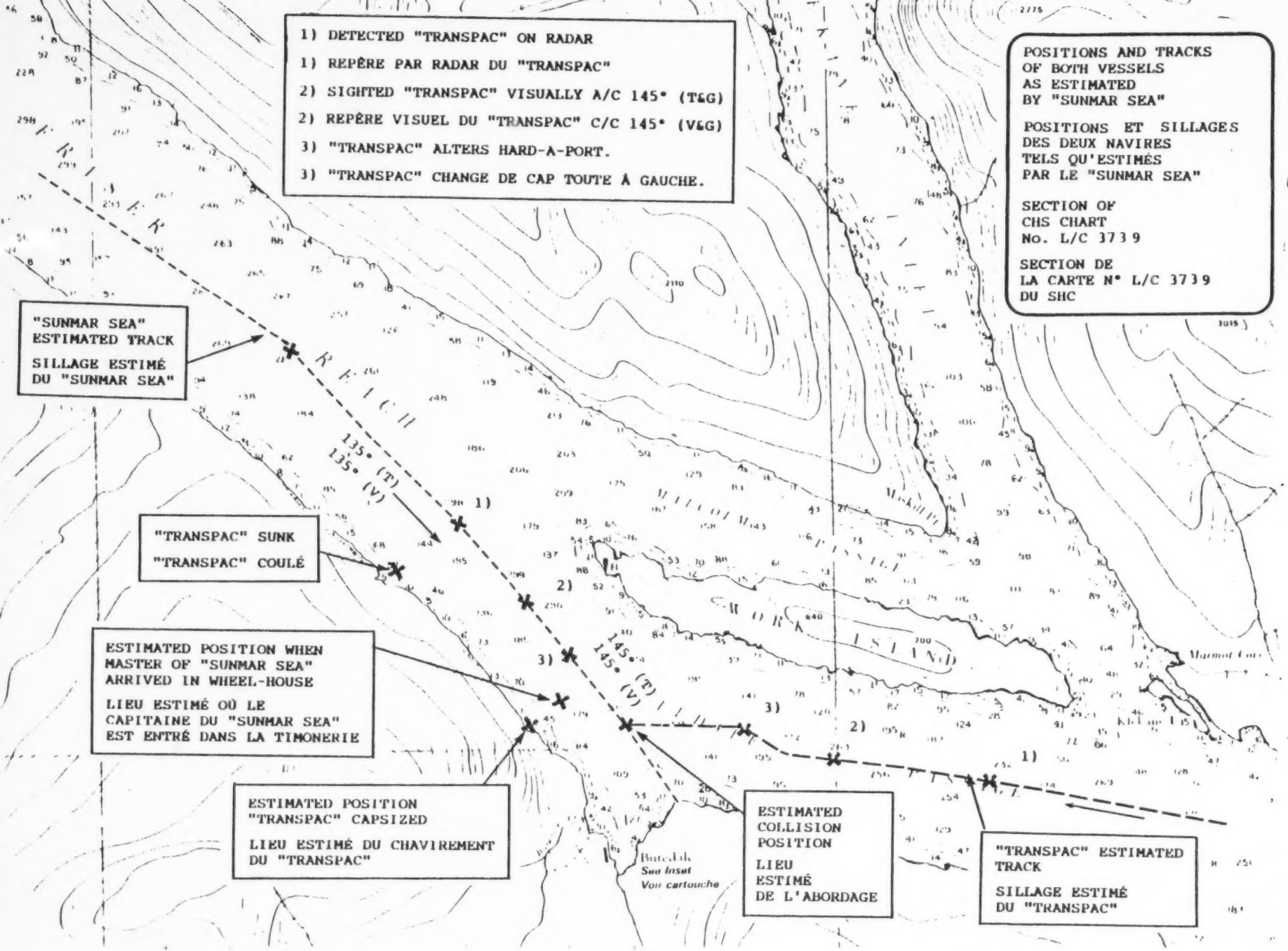
"TRANSPAC"
FIGURE No.1
NOT TO SCALE
"TRANSPAC"
FIGURE N° 1
PAS DRESSÉ À L'ÉCHELLE

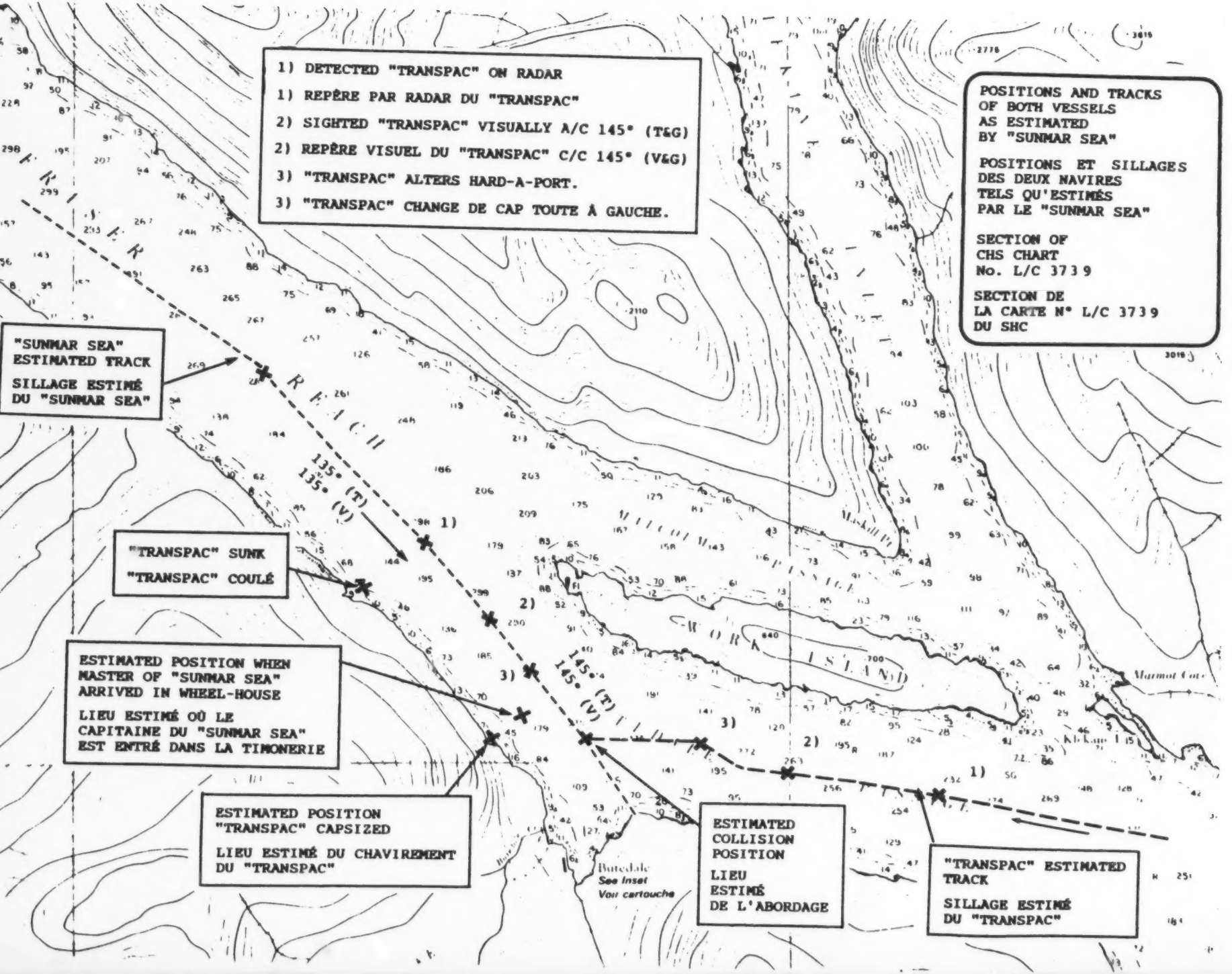

SIMILAR LAYOUT TO
MV "TRANSPAC"
ARRANGEMENT SEMBLABLE
AU N.M. "TRANSPAC"
LUBRICATION OIL
3 000 L
HUILE DE LUBRIFICATION
3,000 L
COFFERDAM
FRESH WATER
PUMP
POMPE À EAU
DOUCE
COFFERDAM
60 kW
CAT. DIESEL
60 kW
DIESEL CAT.
BALLAST
3,750 L
BALLAST TANK
21 000 L
TANK No. 1
BALLAST
21,000 L
CITERNE N° 1
FUEL OIL TANK
95,800 L P/S
TANK No. 7
PORT AND STARBOARD
CITERNE DE MAZOUT
95 800 L B/T
CITERNE N° 7
BÂBORD ET TRIBORD
ENGINE-ROOM
SALLE DES MACHINES
MAIN ENGINE
CAT 398
MAXIMUM HORSEPOWER 1040
MACHINE PRINCIPALE
CAT 398
PUISSANCE MAXIMALE 1040 CV
FUEL OIL TANK
106,000 L
TANK No. 5
CITERNE DE MAZOUT
106 000 L
CITERNE N° 5
BALLAST TANK PORT
29,500 L
FRESH-WATER STARBOARD
29 500 L
TANK No. 10 P/S
BALLAST BÂBORD
29,500 L
EAU DOUCE TRIBORD
29 500 L
CITERNE N° 10 B/T
FUEL OIL
DAY TANK
13,600 L F/O
TANK No. 9 P/S
CAISSE JOURNALIÈRE
DE MAZOUT
13 600 L MAZOUT
CITERNE N° 9 B/T
LUBRICATING OIL
PORT 2,200 L
BALLAST TANK
3,750 L
TANK No. 8 P/S
HUILE DE LUBRIFICATION
BÂBORD 2200 L
BALLAST
3 750 L
CITERNE N° 8 B/T
BALLAST TANK
106 000 L
TANK No. 4 P/S
BALLAST
106,000 L
CITERNE N° 4 B/T
BALLAST TANK
91,000 L
TANK No. 3 P/S
BALLAST
91 000 L
CITERNE N° 3 B/T
BALLAST TANK
45,400 L
TANK No. 2 P/S
BALLAST
45 400 L
CITERNE N° 2 B/T


SECTION OF
U.S. CHART
No. 531
SECTION DE
LA CARTE AMÉRICAINE
N° 531
APPROXIMATE TRACK
OF "SUNMAR SEA"
SILLAGE APPROXIMATIF
DU "SUNMAR SEA"
COLLISION
AREA
LIEU DE
L'ABORDAGE
APPROXIMATE TRACK
OF "TRANSPAC"
SILLAGE APPROXIMATIF
DU "TRANSPAC"
DIXON ENTRANCE
Cape Chacon
Cape Muzon
Langara Island
Prince Rupert
Port Simpson
Porcher I.
Pitt Island
Princess Royal Island
Campania Island
Aristazabal I.
McINNES
Hunghut I
Cape St James
QUEEN CHARLOTTE SOUND
Dellwood Knolls
Dellwood Seamounts
Ogiala Seamount
Chelan Seamount
Cape Scott
KAINS
SOLANDER
DOUBLE


SECTION OF
CHS CHART
No. L/C 3744
SECTION DE
LA CARTE N° L/C 3744
DU SHC
ROUTE OF
"SUNMAR SEA"
PARCOURS DU
"SUNMAR SEA"
COLLISION AREA
LIEU DE L'ABORDAGE
ROUTE OF
"TRANSPAC"
PARCOURS DU
"TRANSPAC"
HEDDINGTON POINT
ASHER POINT
SARAH HEAD
PRINCESS ROYAL
ISLAND
PRINCESS ROYAL CHANNEL
SARAH ISLAND
ARISTAZABAL ISLAND
RODERICK ISLAND
SWINDLE ISLAND
LAREDO CHANNEL
SURF INLET
Fraser Reach
Graham Reach
Grenville Channel
Tolmie Channel
Finlayson Chan
Kitkatla Pass
Kitkatla Bay
Butedale
Kitkatla Inlet
Kitkatla Pt
Tidewater Pt
Mt Johnston
Mt Parry
Mt Irving
Mt Cardin
Commando Inlet
Heiltsuk Inlet
Kent Inlet
Kettle Inlet
Johnstone Pt
Wearmouth Rk
Barnard Hr
Anchor Lake
Deer L
Whalen L
Kingcome Pt
Trivett Pt
Pt Cumming
Pilot Pt
Blackfly Pt
Goat Hr
Kitkatla Inlet
Kiekane Inlet
Maskill Pt
Butedale Inlet
Hattonhush Inlet
Khutze Inlet
Griffin Pt
Yule L
Green Inlet
Quarry Pt
Hecate Anchorage
Carter Bay
Sheep I
Watson B
Bottleneck Inlet
Jackson Pass
Susan I
Quarry Pt
Wreck Pt
Pillsbury Pt
Wallace Pt
Wallace Island
Chappie Inlet
Mallandaine Pt
Racey Inlet
Estmaie Inlet
Heimeken Inlet
Borroughman B
Baker Pt
Panizeau
Wilford B
Waterman
Loading P
Rediern Pt
Mt Cardin
Sound
Kaitlish Inlet
Whale I
Bear I
Deer I
Kitkatla
Kitkatla Bay


POSITIONS AND TRACKS OF BOTH VESSELS AS ESTIMATED BY "TRANSPAC"
POSITIONS ET SILLAGES DES DEUX NAVIRES TELS QU'ESTIMÉS PAR LE "TRANSPAC"
SECTION OF CHS CHART No. 3739
SECTION DE LA CARTE N° 3739 DU SHC
"SUNMAR SEA" ESTIMATED TRACK
SILLAGE ESTIMÉ DU "SUNMAR SEA"
POSITION WHEN MASTER OF "TRANSPAC" ARRIVED IN WHEEL-HOUSE
LIEU OÙ LE CAPITAINE EST ENTRÉ DANS LA TIMONERIE DU "TRANSPAC"
ESTIMATED COLLISION POSITION
LIEU ESTIMÉ DE L'ABORDAGE
1st ALTERATION
1er CHANGEMENT DE CAP
"TRANSPAC" ESTIMATED TRACK
SILLAGE ESTIMÉ DU "TRANSPAC"
2315
2315
Mutton Island
Marmot Cove
See Inset
Voir cartouche


1) DETECTED "TRANSPAC" ON RADAR
1) REPÊRE PAR RADAR DU "TRANSPAC"
2) SIGHTED "TRANSPAC" VISUALLY A/C 145° (T&G)
2) REPÊRE VISUEL DU "TRANSPAC" C/C 145° (V&G)
3) "TRANSPAC" ALTERS HARD-A-PORT.
3) "TRANSPAC" CHANGE DE CAP TOUTE À GAUCHE.
POSITIONS AND TRACKS OF BOTH VESSELS AS ESTIMATED BY "SUNMAR SEA"
POSITIONS ET SILLAGES DES DEUX NAVIRES TELS QU'ESTIMÉS PAR LE "SUNMAR SEA"
SECTION OF CHS CHART No. L/C 3739
SECTION DE LA CARTE N° L/C 3739 DU SHC
"SUNMAR SEA" ESTIMATED TRACK
SILLAGE ESTIMÉ DU "SUNMAR SEA"
135° (T)
135° (V)
"TRANSPAC" SUNK
"TRANSPAC" COULÉ
ESTIMATED POSITION WHEN MASTER OF "SUNMAR SEA" ARRIVED IN WHEEL-HOUSE
LIEU ESTIMÉ OÙ LE CAPITAINE DU "SUNMAR SEA" EST ENTRÉ DANS LA TIMONERIE
145° (T)
145° (V)
ESTIMATED POSITION "TRANSPAC" CAPSIZED
LIEU ESTIMÉ DU CHAVIREMENT DU "TRANSPAC"
ESTIMATED COLLISION POSITION
LIEU ESTIMÉ DE L'ABORDAGE
"TRANSPAC" ESTIMATED TRACK
SILLAGE ESTIMÉ DU "TRANSPAC"
1)
2)
3)
Burdalak
See Inset
Voir cartouche


1) DETECTED "TRANSPAC" ON RADAR
1) REPÊRE PAR RADAR DU "TRANSPAC"
2) SIGHTED "TRANSPAC" VISUALLY A/C 145° (T&G)
2) REPÊRE VISUEL DU "TRANSPAC" C/C 145° (V&G)
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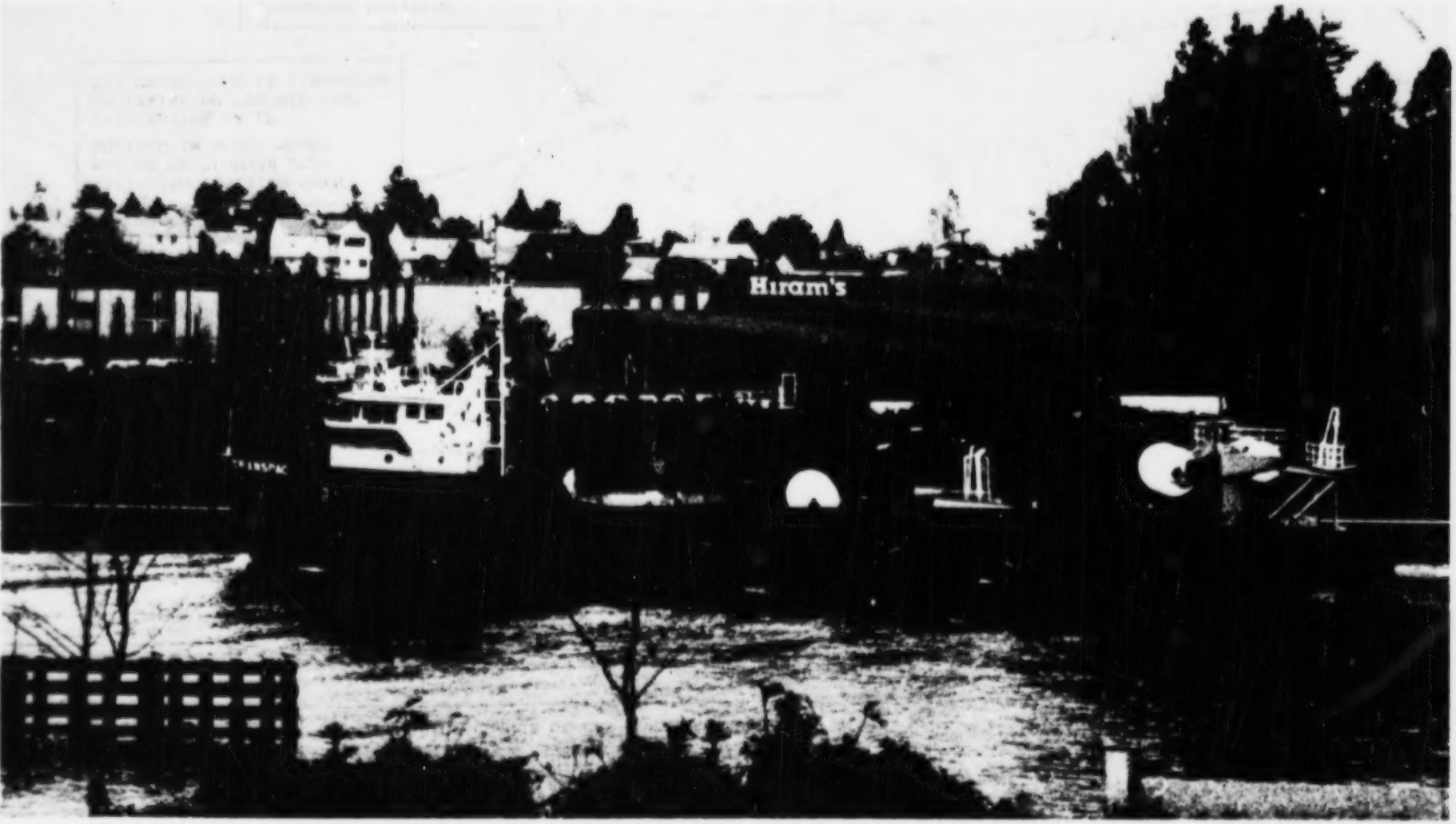
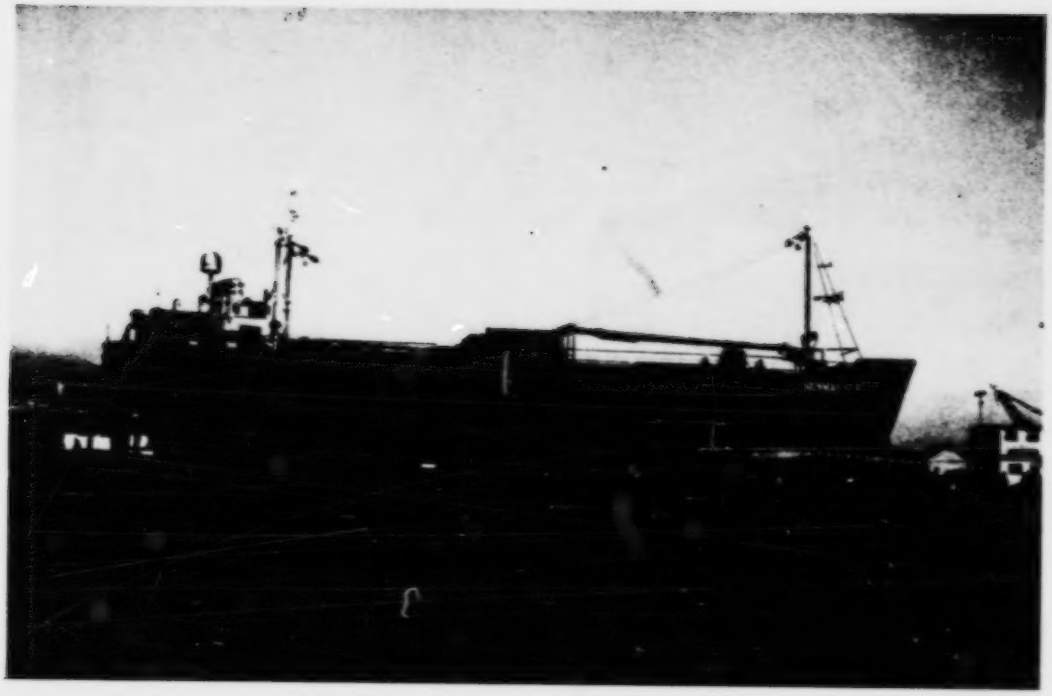
SECTION DE LA CARTE N° L/C 3739 DU SHC
"SUNMAR SEA" ESTIMATED TRACK
SILLAGE ESTIMÉ DU "SUNMAR SEA"
135° (T)
135° (V)
145° (T)
145° (V)
1)
2)
3)
"TRANSPAC" SUNK
"TRANSPAC" COULÉ
ESTIMATED POSITION WHEN MASTER OF "SUNMAR SEA" ARRIVED IN WHEEL-HOUSE
LIEU ESTIMÉ OÙ LE CAPITAINE DU "SUNMAR SEA" EST ENTRÉ DANS LA TIMONERIE
ESTIMATED POSITION "TRANSPAC" CAPSIZED
LIEU ESTIMÉ DU CHAVIREMENT DU "TRANSPAC"
ESTIMATED COLLISION POSITION
LIEU ESTIMÉ DE L'ABORDAGE
"TRANSPAC" ESTIMATED TRACK
SILLAGE ESTIMÉ DU "TRANSPAC"
Batedale
See Inset
Voir cartouche
Marmot Cove


Hiram's

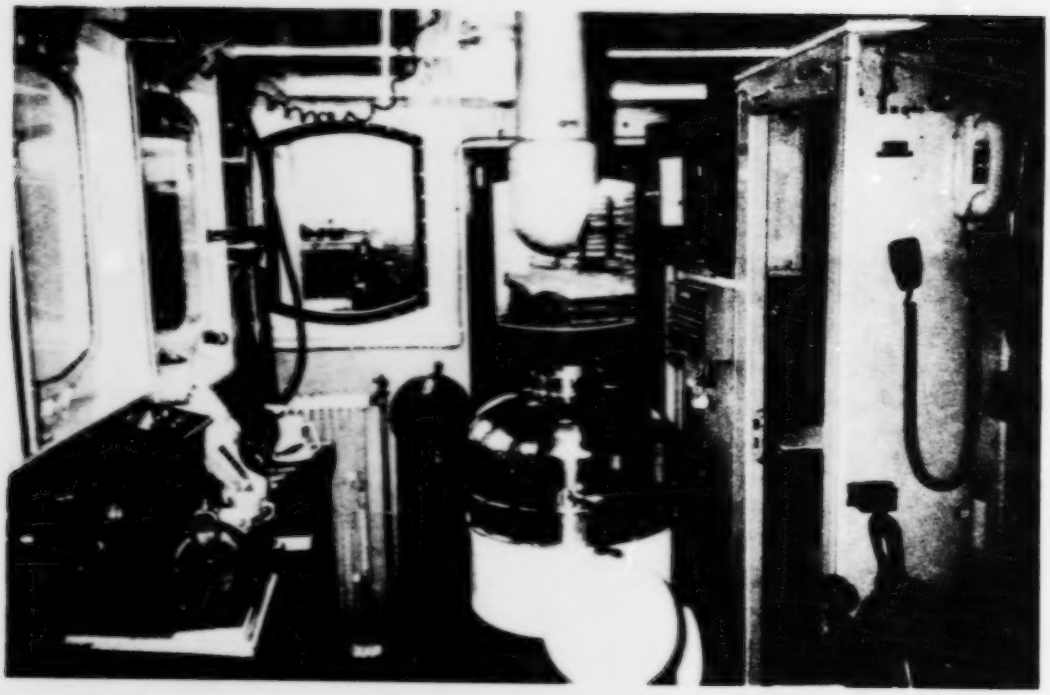
"TRANSPAC"

Liferaft launch ramp.
Rampe de lancement du radeau de sauvetage.

"SUNMAR SEA"

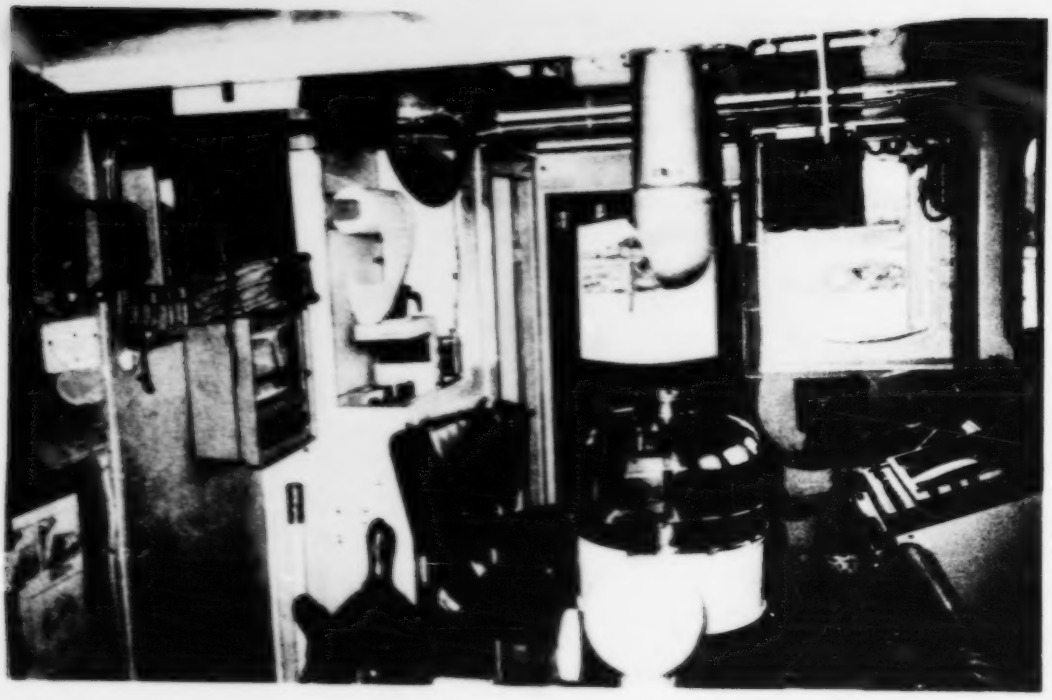


"SUNMAR SEA"

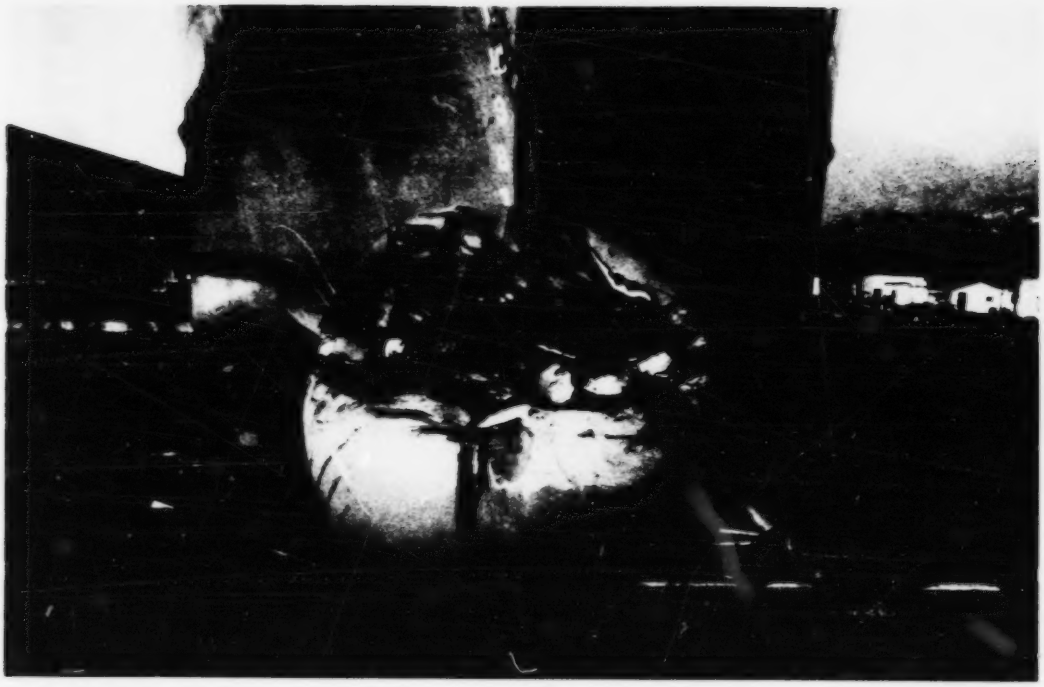


Wheel-house

Timonerie



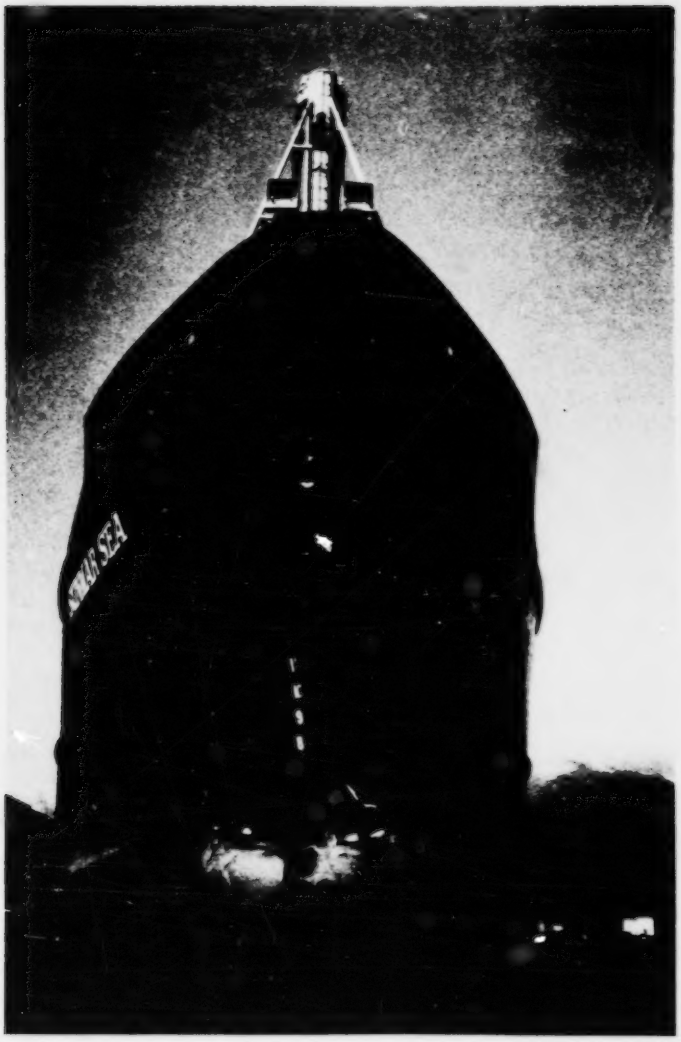
"SUNMAR SEA"



Damage to bulbous
bow and stem.

Avaries à la bulbe
d'étrave et à l'étrave.

"SUNMAR SEA"



Damage to bulbous
bow and stem.

Avaries à la bulbe
d'étrave et à l'étrave.